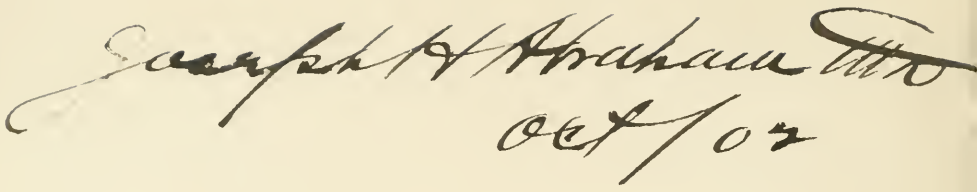

TRANSACTIONS

OF THE

SEVENTH ANNUAL MEETING

OF THE

AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY.

HELD IN

NEW YORK CITY,

May 23, 24 and 25, 1901.

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TRANSACTIONS

OF THE

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HELD IN NEW YORK CITY, MAY 23, 24 AND 25, 1901.

Dr. D. B. St. John Roosa delivered the address of welcome. He spoke as follows:

Mr. President and Fellow Members of the American Laryngological, Rhinological and Otological Society:

I consider it a very great honor to be called upon in any manner to represent the profession of the City of New York, in welcoming you gentlemen from other parts of this land, and from the neighboring Dominion to this annual meeting. I have no claim to make this representation except by the gracious invitation of your officers. I may claim, however, to be a New Yorker of New Yorkers, having been born, like my ancestors, near the city, and having spent all of my professional life in it, and being interested in everything which concerns this metropolis. And as a humble representative of this mighty army of our profession in New York, and as a citizen of this town, as we formerly called it, I welcome you most heartily to it. We New Yorkers are in the habit, unfortunately, of saying some things against New York to each other, but we never say them outside of the city nor to strangers.

As regards the profession to which you and I belong, we never need, either outside or inside of New York, to say anything which might prevent us from being filled with a proper pride and self-respect, because the medical profession of this city and of this State aims to keep abreast with its fellows in the other great States, and with its friends in the Dominion. It aims by liberality

and catholicity, to recognize the fact that the only standard in the medical profession is qualification, to practice according to the light given us by the researches of the men of our science and art throughout the world. That is all that New York State demands of one who desires to be a legally qualified practitioner. The law has been enforced in that manner since 1891, greatly to the advantage of the profession and of its influence in every respect.

But New York has done something for the part of the profession of which you are distinguished representatives. We have not quite amalgamated rhinology and otology, even as they ought to be amalgamated, but I may say that laryngology can hardly be said to belong to rhinology and otology, but the separation of the two latter is destructive to knowledge, as you all know, and we are welcoming everything which shows an advance in that direction.

On that side of the room is the bust of a pioneer in laryngology —Horace Green, who did his work in New York, and in this city, I believe, the first society was formed for the cultivation of otology. It is true it was in connection with ophthalmology, as at that time they were supposed to belong together, but in process of time otology has taken its separate place. I am not going, however, to inflict reminiscences upon you. When I first translated a book on diseases of the ear, written by a German professor for the benefit of the profession, I ventured to quote a Latin proverb to show that a man must not be too anxious to see the fruit of his own work, and I may venture to requote that proverb now: *"Abores seret diligens agricola quarum adspiciet baccam ipse nunquam."* Many of us working at that time supposed that we would never see the fruit of our work, yet what do I see before me now? The faces of a large number who have done great work in otology, and this specialty fully recognized.

Horace Green made topical applications to the larynx without being able to look at it, and in this very Academy it was denied by some that it was possible for him to do this.

As for otology, when I entered a certain institution as a surgeon, the ear patients were corralled, after all the eye patients had been seen, every window in the room was shut up, and with a clumsy apparatus the next hour was devoted to the diagnosis and neglect of aural patients. How has all this been changed! I have lived to see antiseptic surgery arise, the opthalmoscope, laryngoscope and the otoscope invented, and the work now done

in rhinology and otology, and this is so much for one lifetime that one is overcome in thinking of it.

Now, gentlemen, we New Yorkers welcome you here; you will be welcome in all the hospitals and in all the institutions where the specialties which you so sedulously cultivate, and of which you are such ornaments, are practised. Many of those who practise in those hospitals and teach at those schools sit at your side this morning. I hope you will not think it inappropriate if I extend to you an invitation, on behalf of the Executive Committee of the school of which your secretary is an honored professor, the New York Post-Graduate School. If at any time during your presence in this city there are any clinics going on there that you are interested in, you will be very welcome on the presentation of your cards.

I end where I began. This is one of the greatest honors that has been conferred upon me in my humble but earnest professional life—to have had the pleasant task of welcoming you in behalf of our profession in this city. I have had the opportunity of shaking hands with many of you whom I had not known before. I thank you most cordially for the kindness with which you have received me, and I wish for you a most successful, happy and prosperous meeting. (Enthusiastic applause.)

ADDRESS OF THE PRESIDENT.

ROBERT C. MYLES, M.D.

Fellows of the American Laryngological, Rhinological and Otological Society:

Among the pleasant duties and privileges vested in me as your presiding officer, none is more highly prized than the opportunity of extending to you the hand of cordial friendship and hospitality. In behalf of myself and your colleagues, who reside in this city, we welcome you as brothers in a common cause, bound by ties and duties that admit of no selfish aims nor sordid motives. Within the precincts of this building, sacredly devoted to the science of the healing art, we mingle as loyal confreres, and give to each other and to the world at large, all of the best that we may possess for the relief of human suffering and the protection of human life. And when, our deliberations concluded, we leave this hall, you will be piloted by an entertainment committee and by the resident members into ways and places that I hope you will consider neither sad nor dull.

This is an era of advance and expansion, and all the world is our field for collecting the knowledge that relates to our specialties. Our faith in honest work is akin to religion, the doors of our scientific temple are open to all who have the ethical character, attainments, and the practical experience that are requisite in our high calling.

The history of our Society, though brief, is one of brilliant success.

At the founders' or organization meeting, held in New York on June 19, 1895, eleven physicians were present, and acceptances of membership were received from eleven others. From this nucleus of twenty-two our Society came to number 124 at the time of our second annual meeting, held in the city of New York on April 17th and 18th, 1896. At the third annual meeting held in Washington, District of Columbia, on May 1st to 3d, 1897, the membership roll reached 153, and at Pittsburg, on May 11th and

12th, 1898, we numbered 165. Our ranks have continued to fill and to-day we are 226 strong, with a fair list of candidates.

OTOLOGY.

It is claimed that pneumococcus otitis is a specially treacherous affection, and that after a patient is apparently entirely well with hearing restored, a mastoid or endocranial suppuration may develop. Hence the need of a guarded prognosis and watchfulness in an otorrhœa due to pneumococci.

One of the most considerable advances in otology appears to be the repairs of the internal ear and other osseus tissues, after destructive interventions, by epithelial grafts, the results are stated to be brilliant from all standpoints, including restored hearing.

LARYNGOLOGY.

In regard to cancer, there is a general belief that thyrotomy is the operation of the future, with partial resection as an alternative, much will depend upon the making of an early diagnosis.

Under the head of Röntgen ray diagnosis, it is stated that laryngology has been materially benefited by reason of the fact that the rays often reveal an aneurism or some other intrathoracic cause of laryngeal disturbance.

In regard to the perennial subject, hay fever, the most novel treatment propounded in 1900 was Holbrook Curtis' plan of minimizing against the disease by prescribing a tincture of the pollen of ragweed for two weeks before the annual attack. The author obtained remarkable results in the few cases treated.

RHINOLOGY.

It is a custom more honored in the observance then in the breech, to call attention to the recent progress in our departments of medicine and surgery. The large monograph of Hajek on inflammation of the Accessory Cavities of the Nose gives us the first systematic treatise upon this subject, which cannot fail to exercise great influence upon its future. Two subjects of special interest to general medicine are to be found in the work of Violler on "Nasal Defence," and in Solomon's paper on" Feeding Through the Nose." Violler finds that the nasal leucocytes are very active in

taking up foreign particles, bacterial and otherwise, and that this power is not forfeited in ordinary rhinitis.

The gas-douche, introduced by Joal consists in the application to the nasal fossa of nascent carbonic acid gas. A special generator is required. Joal claims that he can abort a fresh cold, and beneficially affect acute and chronic coryza, vasomotor rhinitis, etc. A similar device is also manufactured by the New York Sparklet Company.

Ziegelroth, an advocate of mechanical therapy and diet, claims that intra-nasal massage will be a feature in rhinological practice of the future.

But I will not detain you with felicitations. My immediate purpose is to make a serious appeal to you—an appeal in favor of a broader specialism. I sometimes fear that a certain charge brought against us may be true; namely, that we concern ourselves too exclusively with local conditions. We study affections of the nose, the pharynx, the larynx, and neglect the larger view. Having been in general practice for many years before taking up our specialty, I know that to a certain extent the charge is true. I am inclined to believe that the natural tendency of special work is to narrow rather than to broaden. This tendency is one that we should for this very reason the more vigorously resist. It is not to be wondered at that medicine should have become in late years so largely specialized. The extraordinary development which has marked its recent progress has compelled men to devote themselves to some one branch, and no one knows better than physicians themselves how much mankind owes to the broad and comprehensive specialism practised by so many. I regret that I cannot say by all, specialists at the present time. But while mankind has profited, in some cases our profession has suffered. A too intense specialism has often narrowed the physician's range of view and more than this, it has altered the personal relation between the physician and patient, in many cases transforming it into a transient and merely business connection; it has, in a word, given it a mercantile taint. In a land so material and practical as our own, it is not surprising that the profession of medicine, among others, should have been in some degree affected by these mercantile conceptions. It has been adopted by men of little special and not much general knowledge of our great science; and this has tended to bring down our profession from its former higher standards. It has in consequence brought about another injurious

tendency—a lessening of the respect and of the higher confidence which should prevail in the actions of patient and physician.

Specialism again has militated against that scholarship in medicine which was once so characteristic. Dr. De Costa feared that specialism would banish the scholar in medicine, whom he described as "an attractive figure indeed. We see him pursuing what noble ends, ambitions for what lofty recompense, passing from life's beginning to its end, not grasping and scrambling for petty prizes or fleeting reputation and wealth, but aiming only at lofty objects."

Now there is no sufficient reason why the specialist of to-day should not be like the old practitioner, whose heart was generous, whose ways were gentle, who to a sound knowledge, added a wide range of sympathies and liberality of thought and feeling, and who above all was deeply impressed with the ennobling responsibility of his profession.

Now, I maintain that there is nothing in specialism as such which militates against a high purpose in medicine. The fault lies with some of the men who practice it, with their departmental view of men, their narrow sympathies, their cash consultations. I want to urge the renewal of closer, worthier relations between the physician, in this case the specialist, and his patient. It is the modern up-to-date, mercantile specialist who brings criticism upon it, has impaired these worthy relations. To him his profession is a business.

I hope, gentlemen, you do not think that I am too severe in these strictures. The mercantile idea in medicine is abroad in the land and we specialists must not give any further ground for the complaint that we foster and encourage it.

Mr. Abraham Heywood, in one of his delightful essays, says of Sir Henry Holland, that scholar, physician and gentleman, "Except when humanity required, he discreetly suppressed the doctor," and in reference to his reticence about his patients, Mr. Heywood adds: "He deemed that the physician's lips should be sealed like the confessor's." So it is written in the oath of Hippocrates: "Whatever in connection with my professional practice, or not in connection with it, I see or hear in the life of men which ought not to be spoken of abroad, that I will not divulge it."

Personally, I have always considered the profession of medicine the noblest of all vocations; nor even by the world at large is it held second to that of the clergyman. And whether we are practising general medicine or a specialty, we should make every

effort to keep to a plane of high endeavor, to maintain the standards of the scholar and the gentleman. Especially let us do everything in our power to prevent our profession from becoming mercantile and our patients looking on a consultation as they do on a visit to a shop where in return for so much cash down certain goods are handed out to them over the counter.

You must not think that I am arrogating the right to lecture you distinguished gentlemen, but I am sure that you will all agree with me in the note of warning which I have taken the liberty to sound.

I thank you for the honor you have done me in electing me your President, and I shall rely upon your faithful co-operation in so conducting this meeting that it shall redound to the honor and welfare of our organization.

The object of this society is, of course, to give every worthy specialist the advantages of scientific and social intercourse with those working in the same field as himself. Its doors are open to young men as well as to older.

I am glad that we made a special point of this from the beginning for the mingling of the older and younger men in our specialty has been beneficial to both, the conservatism of the one counterbalancing the sometimes overzealous and radical enthusiasm of the other. And we have every reason to be gratified at the growth of our Society, not only in the increase in number, but in the character and ability of the men whom we have elected since our first meeting in 1895.

Gentlemen, we have an extensive and attractive programme, I will not detain you further, but declare the seventh annual Congress of the American Laryngological, Rhinological and Otological Society open, and feel confident that all will find pleasure in and receive benefit from the proceedings.

PAPER:

"A CASE OF CORRECTED EXTERNAL AND INTERNAL DEFORMITY OF THE NOSE."

T. PASSMORE BERENS, M.D.

Mr. "X.," aged twenty-six years, came to me with history of injury to the nose received in early childhood. The nose, as you see in photograph (A), taken before the operation, was a large one and presented the following conditions. The bridge of the nose was much elevated, very large, deflected to the left and had a concavity on the right side, while there was a corresponding convexity on the left side, *i. e.*, the whole bony framework had been pushed to the left and formed a large disfiguring "hump." The right nasal bone was smaller than that on the left. The soft parts of the nose were pushed to the right, and the tip occupied a position one-half inch to the right of the center of the lips.

Internally. The septum was deflected to the left and adherent to the upper two-thirds of the inner border of the outer wall of the vestibule, causing an almost complete occlusion of the naris. The right naris was free, and showed clearly the concavity of the deflection extending into the perpendicular plate of the ethmoid bone. The operation performed under ether anesthesia was as follows: A vertical incision through the skin and periosteum was made from the center of the root of the nose over the hump down to the middle third of the soft parts. The periosteum with the adherent skin was pushed aside with a periosteotome, and the nasal bones and part of the lateral cartilage laid bare. The bony hump was removed with a chisel. The flaps of the skin and periosteum were then trimmed of their redundant tissue, and two small bleeding points coming from the lateral cartilages were touched with the galvano cautery, the wound was closed by a subdermal suture. It was then dressed with flexible collodion without gauze. The septum was then freed from its adhesions by incision and broken with Adams forceps, the breaking being carried well into the vomer and perpendicular plate of the ethmoid bone. The right nasal bone was grasped with the same forceps and bent outward by breaking it from its articulations, the left nasal bone was

forced into place by a few strokes of a mallet, the soft parts having first been protected by a quadrilateral steel bar guarded with heavy rubber tubing. A splint made of sheet gutta percha bent upon itself and properly shaped was inserted in the left naris, and the nose moulded into a straight line by the fingers. No external appliance was used to hold the nose in shape, and I wish to emphasize this point particularly. The external wound was found healed five days after the operation, and the dressing permanently removed. The splint was carried four weeks. The patient is before you for examination. Photograph (B).

DISCUSSION.

Dr. Otto J. Stein, of Chicago, said he understood a forceps had been used to break loose the nasal bones from their attachment to the frontal and superior maxilla. He had himself done this operation several times, and on the last two occasions had experienced great difficulty in breaking the bones loose from the superior maxilla. The condition brought about by the blows had been so severe that it did not seem to him that a repetition was warranted.

REPORTS OF CASES:

THROMBUS OF THE LATERAL SINUS.

Dr. Thomas J. Harris, of New York, presented a patient with the following history:

A man, about twenty-three years of age, had been admitted to the hospital April 3, with a history of pain and otorrhea for about one week and a swelling in the neck. There was no elevation of temperature at the time, and he complained only of frontal headache. A few days later an exploratory incision was thought to be necessary, and accordingly the mastoid cells had been opened, but nothing had been found. A long clot was removed from the sinus. From that time to April 17 he had done well, but on a return of the symptoms the incision had been extended to the clavicle and the jugular vein opened, no clot being found until the facial vein had been reached. The man had been very ill for several days afterward, and had had a metastatic pneumonia. At no time had there been any tenderness over the mastoid, and no pus had been found in this region. The pain complained of had been almost

wholly over the frontal lobe of the brain. The symptomatology of this case had been quite obscure.

DISCUSSION.

Dr. M. D. LEDERMAN, of New York, said that one must not expect to find the classical symptoms either in sinus or mastoid disease. In one of his own cases there had been a running ear for ten weeks, but none of the classical symptoms of mastoiditis. The usual mastoid operation had been done, and no disease of the sinus found; paracentesis had resulted in the withdrawal of blood. In his opinion such a procedure was not sufficient; it was better to make a bacteriological examination in addition. After a week or two in this case the sinus had been exposed and jugular thrombosis found. The vessel had been ligated near the clavicle and opened, but no blood found. Owing to the very bad condition of the patient, the complete operation had not been done. The patient had ultimately died. In another case there had been acute involvement of the mastoid, in a woman who had had one child. The sinus was curetted to within one inch and a half of the torcula, and jugular exposed. It was tied close to the clavicle and opened, and a turbid fluid was found. About ten days afterward there had been an elevation of temperature and a swelling of the neck. On cutting down upon this no pus was found, but an inflammation of the veins existed. Under a wet dressing the patient made a good recovery.

Dr. WALTER B. JOHNSON, of Paterson, N. J., had had a similar case to the one presented by Dr. Harris. The patient had been sent home on account of homesickness, and had temporarily improved. When the true nature of the case had been discovered, operation on the jugular was advised, but declined, and the patient died.

Dr. HARRIS said that it should always be remembered that it was not necessary for the patient to have a decided chill before one feels justified in making a diagnosis of involvement of the sinus. In the case under discussion there had been no chill, but there had twice been chilly sensations. With high temperature and chilly sensations one is warranted in making an exploration.

A CASE OF SINUS DISEASE.

Dr. Edward B. Dench presented a patient upon whom he had operated about six weeks ago for acute mastoiditis. The internal table had been found carious, and a clot had been discovered in the sinus. There had been an unusual elevation of temperature after the operation, and on the fourth day he had ligated the internal jugular vein and had found a softened clot. Since then recovery had been uninterrupted.

THE NATURE OF CANCER.

Dr. Henry L. Wagner, of San Francisco, presented drawings illustrative of the work done by an investigator in his city on the nature of cancer. About two months ago this gentleman, Dr. Eisen, had become infected with cancer, and was now practically in a dying condition. His important and interesting research had been completed about two years ago. He had studied the development of the spores in his own case. Upward of seventy cases of carcinoma had been investigated in this way, and the results would be eventually published in detail in book form.

A CONGENITAL DEFORMITY OF BOTH AURICLES.

Dr. Wagner also presented a photograph of this condition in a boy of five. There was an absence of the inner part of the upper helix and great overdevelopment of the anehelix. The deformity was the result of an arrest of development occurring during the second and third months of intra-uterine life.

PAPER:

THE DIFFICULTIES ATTENDANT UPON THE PROPER TREATMENT OF DISEASES OF THE EAR IN DISPENSARY PRACTICE.

FRANCIS R. PACKARD, M.D.

I have been led to make the following brief presentation of facts because I believe it to be the duty of those who have charge of the otological departments of our hospitals to do all in their power to render their dispensary services of the greatest possible utility to the patients, the hospital and to their own scientific interests. I hope to arouse interest and discussion of the matter on the part of hospital boards of management as well as of physicians with a view to the betterment of the conditions I mention, and I think the same statements apply largely to other dispensaries as well as those for the treatment of diseases of the ear.

All of us are familiar with the fact that the cases of aural diseases which we treat in our offices respond much more readily to treatment and are cured or relieved in much larger proportion than are those seen in dispensary practice. I have thought carefully over the reasons for this and have discussed them with a number of others who are engaged in hospital work, and I now present some of the conclusions at which I have arrived.

First, as regards the social condition of our hospital clientele. Of course, this varies greatly in different hospitals; in one consisting of respectable, hard-working people; in another made up largely of foreigners; and in yet another of the colored race. In most large city hospitals it consists of a mingling of various races and all sorts and conditions of men.

In the Pennsylvania Hospital the patients in the ear dispensary consist largely of Russian Jews, Italians, and Sclavs. These people, as rule, do not understand English, are filthy in their habits, living in the most squalid conditions. It is impossible to even make them understand directions, much less to make them carry such orders out, as regards return visits and home treatment. Very few of the foreign patients possess sense enough

to bring an interpreter with them, and if you do procure someone who can talk to them he usually understands very little more of your instructions than the patients themselves. The class of patients who suffer most from this condition are the children with suppurative ears. The parents cannot be depended upon to properly cleanse the ear of the ever accumulating discharge, or to bring the child back to the Hospital on the days designated for its treatment. Such neglect results in filthy eczematous conditions in the external ear, in mastoid involvement, or in brain abscess. Frequently I have sent children into the Hospital, where a few days' proper treatment has terminated in recovery what would otherwise in all probability have resulted in a very chronic, possibly fatal, condition, whom I had reason to suppose would be thus neglected. Many times these people through ignorance will not consent to leave their children in the Hospital even when they are very sick. Consent to operations, even as minor as the removal of polypi, or the evacuation of an abscess over the mastoid, is frequently refused and the condition of the ear thereby greatly aggravated.

Secondly, the difficulty of properly examining and treating the patients, because of the overcrowding of most dispensaries, is to my mind a very real evil. What aurist would venture in his private practice to treat patients, taking them just as they come, new and old cases, serious and trivial, at the rate at which dispensary patients are generally rushed through? Many of the cases present features of much interest over which one desires, and ought to linger, but there is always the ever-pressing throng clamorous for their turns. The examination with the speculum is usually all that can be satisfactorily made, the functional examination requiring time and quiet, which are but too seldom procurable, and yet as Dr. Randall (*Journ. American Med. Assc'n.*, March 23, 1901) has recently emphasized, how essential such functional examinations are. I cannot but think that one reason why such functional examination is often neglected is because we have become habituated to its neglect in our dispensary work. If useful with our private patients it is surely just as valuable with those we see in dispensaries.

After examination comes treatment, and here the time limit again operates to the disfavor of our patients. A case of impacted cerumen may require ten or fifteen minutes; the proper cleansing of a suppurating ear to be done with thoroughness and with comfort to the patient may require fifteen or twenty minutes. A few

cases of this kind will consume time to such an extent that the rest of the patients must be hurried through at breakneck speed.

Thirdly, how difficult and almost impossible it is to keep records of dispensary cases. The first visit is always at our dispensary made a matter of careful record, but after that, unless one of us is particularly interested in following up some particular case, I am afraid the record is usually left blank. How utterly worthless dispensary records are! Partly on account of failure to note progress, partly because practically no ultimate results can be noted, the patients disappearing from observation as soon as they are cured, or if not cured, because they are discouraged and, treatment costing them nothing, they want to make a change.

How shall we overcome these difficulties? The question of hospital management so that there shall be the greatest amount of good accomplished with the least waste of the money so charitably given for the relief of the sick poor is a very deep one, and may be considered as beyond the province of the present paper, but it seems to the writer that no province of hospital work has been more neglected as regards its business management and stands in more urgent need of reform than the dispensary service, and to this lack of attention is to be attributed its comparative failure. The managers and superintendents of hospitals as a rule pay close attention to the condition of the buildings, to the average cost of maintenance of patients, the expenses of the drug department, and to the proper performance of their duties by the physicians and surgeons in the wards. Great attention is paid to the admittance only of proper cases to the wards. Efforts are made to have a sufficient surgical armamentarium in the operating rooms.

Now let us turn to the condition of affairs in the average dispensary.

We have heard lately a great deal of talk of dispensary abuse by patients who are able and should be made to pay for the services of a physician. This talk is largely based on the injury supposed to be inflicted upon the doctor. The truth is that as a rule the doctor suffers less than anyone from this really grave abuse. The charitable people who have given their money to relieve the sick poor may here behold their funds misappropriated. By adding to the number of patients to be treated these beats take up time which should be given to the suitable objects of charity; by adding to the expense of the dispensary they lessen its power to enlarge its means of doing good. It is this detestable class of patients who always insolently expect more trouble to be taken with

them and more time given to them than can be given to the truly poor. To a great extent this evil could be remedied if in every hospital a dispensary clerk was maintained, whose duty it should be to issue cards to suitable persons for dispensary treatment. If the person applying for treatment appeared as though he ought to be able to pay, a minute inquiry should be made into his circumstances, and if not an object of charity he should be refused treatment. The Eye, Ear, Nose and Throat Hospital of New Orleans has a registration clerk, and from its last annual report I quote the following paragraph:

"Forty-two persons acknowledged their ability to pay, and were denied admission by the clerk at the registration desk. Besides these, there were 57 cards withdrawn by the examining surgeons; 37 in the eye department and 20 in the ear, nose and throat department, making a total of 99 applicants who were discovered in the act of imposing, intentionally or not, on a charity founded for the poor only."

Probably many more patients who could pay were deterred from applying by the mere knowledge that their circumstances would be inquired into.

A man of discretion in such a position would possibly save his salary to the hospital in the course of a year and his labors would be of the most direct benefit to both patients and doctors.

Almost all dispensaries are cramped for room and consequently seriously hampered in their efficiency. Every otological dispensary should consist of at least three rooms, a waiting-room, a quiet room in which new patients could be studied and in which functional examinations could be properly made, and a room for the treatment of routine cases. No otological dispensary should ever be run unless equipped with sets of tuning-forks and other instruments necessary for the most accurate diagnosis. Many otological dispensaries possess but one tuning-fork, and that tuning-fork is rarely used because of lack of time, and the noises which usually accompany the work in a busy dispensary. How rarely are the Galton whistle or the acoumeter to be found among a dispensary's equipment!

It is but right that we whose daily work lies in dispensaries and who must be struck with the miserable waste of money and effort which is daily taking place in them, should be the first to point to the existence of such evils in the dispensary system. How else can we hope to impress superintendents, who in their efforts to fulfill the wishes of the managers, must devote their time and

labor to the *hospital* in distinction to its dispensaries, or managers, who perhaps never visit the dispensaries during the hours when work is being carried on in them, and who often really know but little of what goes on in the hospital, save what can be seen from the books of the superintendent, and by their walks of inspection through the buildings and wards. The managers are apt to base their ideas of the work of the dispensaries on the statistics of patients. If these show, as they usually do, a steady increase in number, the managers point with pride to the increased usefulness of the dispensaries, little thinking that this increase has in reality greatly diminished the ability of the dispensary to do good.

Finally, it seems to me incumbent on all those physicians who work in the special dispensaries, whether for the ear, nose and throat, or eye, in which these abuses are most apparent, to lose no opportunity to insist that the dispensary work be as carefully provided for as the work done in the wards, that the number of cases handled be restricted to those which can be properly studied and treated, and that every dispensary contain an up-to-date complete armamentarium. Only by so doing can we bring the dispensaries up to a level upon which they will perform scientific work and at the same time benefit those worthy of charity. A hospital which wishes its work to result in the greatest amount of benefit to those worthy of its charity should see that the agents selected to carry out its work are given every facility to properly perform their duties, and then should see that those duties are properly performed. At the present time I am convinced that in most dispensaries there is a large absolute waste of clinical treatment for scientific study. Medicine and surgery have in recent years made such enormous advances largely because the cases in the wards of hospitals have been so thoroughly utilized for purposes of study. In the modern dispensary, however, entirely too much attention is paid to securing an enormous attendance of patients and then rushing through their routine treatment, without stopping to study individual cases, not only at their first but at their subsequent visits.

PAPER:

TRAUMATIC DISLOCATION OF THE LEFT ARYCARTILAGE.

HENRY L. WAGNER, M.D., PH.D.

A traumatic dislocation of an arycartilage is extremely rare. The only reference in literature to such that I have been able to find is the case reported by "Hopmann" (Heymann's Handb. d. Laryncologie) where a dislocation of the right arycartilage with a dilaceration of the right vocal cord was observed. The following is, in brief, the history of a case of simple dislocation which came under our observation in the S. F. Polyclinic.

An elderly man, seventy-two years old, was struck by a drunken soldier—the blow landing on the throat. The victim fell to the ground unconscious where he lay for some time, until he was picked up by friends. On regaining consciousness he found that he was unable to speak; his breathing was difficult and he experienced an intense pain in the region of the neck where he had been struck.

The next day he sought advice at our clinic, when the following conditions were found to exist: No marked swelling externally, but within the larynx, especially in the region of the arycartilages and the false and true vocal cords, the swelling was so great that the contour of the different parts of the larynx could scarcely be traced. On the left side a slight crepitation could be felt, though no abnormal mobility of any part of the larynx could be perceived. The patient complained of dyspnea and of a great deal of pain when swallowing. On the other hand there was no bloody expectoration. The voice, however, was hoarse and the articulation so muffled that his utterance was scarcely intelligible. An ice compress externally and a laryngeal alkali spray was successfully used. A few days later the swollen condition of the larynx had materially subsided. Neither fracture nor infraction could be observed and the crepitation had disappeared entirely. We were now able to perceive that the left arycartilage was somewhat dislocated and thrown to the front of its normal position and fixed between the respiration and

phonation line of the vocal cord. There was still a good deal of pain, though the dyspnea was considerably lessened,—the voice continuing husky. This condition lasted for a number of weeks until it had, under massage-treatment, nearly disappeared. At this stage the patient ceased his visits and further observation was prevented.

It is remarkable in our case, that no fracture or infraction of the laryngeal cartilages took place, for at the patient's time of life these cartilages generally become more or less ossified, and that the trauma resulted only in a dislocation of the left arycartilage from its cricoid-joint.

PAPER:

A CONGENITAL DEFORMITY OF BOTH AURICLES.

BY HENRY L. WAGNER, M.D., PH.D.

A boy of German parentage, five years old, who was born prematurely by two months, shows an interesting congenital deformity of both auricles. The deformity, equally marked on both sides, consists in the absence of the inner part of the upper helix. The mising part of this cartilage can easily be traced and circumscribed by the touch of the fingers, lying as it does deeply hidden under the skin. We can notice further an "incisura helicis" which is produced by a conjuncton of the enlarged helix and a second hidden cartilage running parallel to the upper visible helix. The nature of the deformity is clearly shown in the accompanying photograph. Both hidden cartilaginous rudiments are connected by a small bridge apparently of the same structure.

The anti-helix is very much over developed and runs without forming any crura into an abnormally deep groove. The position of the anti-tragus to the tragus is also considerably altered, though other parts of the ear such as the external meatus, the tympanum, etc. are normal as is also the sense of hearing.

According to "His" this deformity can be traced to an arrest of development between the second and third fetal months, when the auricles begin to grow away from the head and to take definite shape.

The boy's mental condition shows imperfect development and he is just now beginning to speak, conditions to which "Gradenigo" has called our attention in cases of deformed auricles.

PAPER:

DISEASE OF THE UPPER AIR PASSAGES IN RELATION TO MENTAL DEVELOPMENT.

BY L. F. PAGE, M.D.

The two chief conditions within the organism which may retard mental development are an impure and imperfect blood supply to the growing nerve centers and over-stimulation from abnormal conditions which may exist in any organ of the body. The first of these conditions, an impure and imperfect blood supply, may be considered under the head of auto-intoxication as originating in the diseased portions of the upper respiratory tract. That this is a favorable region for the lodgment of germs and the elaborations of toxins would, it seems to me, be obvious to every one who works in these regions. Pantzer, in a paper entitled "The Nose as a Factor in Post-Operative Diseases," has called attention to this region as a source of infection. Bouchard, in his work on "Intoxication in Disease," does not mention this part of the organism as being a source of intoxication. We may assume that the general doctrine of auto-intoxication is well founded since so much convincing proof has been adduced in its favor. If this doctrine be true it only remains for us to show that the upper respiratory tract in disease is a favorable soil for the generation of toxic agents, and that they may be easily absorbed into the circulation owing to the rich glandular supply. We can readily understand how defective drainage and pressure in nasal fossæ and tonsilar tissues, causing swelling and stasis in the venous and lymphatic channels, affect the brain functions. The intimate relation existing between the lymphatic spaces and the blood vessels of the nasal mucous membrane and subarachnoid space has been thoroughly demonstrated. Schwalbe and Retzius were able to inject the lymphatic vessels of the nasal mucous membrane through the arachnoid space. It has also been shown that an equally intimate relation exists between certain venous regions of the nose and the interior of the skull. The dullness which so often accompanies engorgement and stenosis of the nasal chambers is probably due to the large percentage of carbonic

oxide contained in the stagnant venous blood. The capacity of the lymphatics connected with the upper air passages for rapidly absorbing toxic materials generated in this region is often observed in conection with diphtheria, tonsilitis, and other acute affections. We sometimes see a rapid toxicity following a slight cauterization of the nasal mucous membrane with the electrocautery. The frequent enlargement of the glands of the neck, associated with chronic diseases of the tonsils and chronic nasal catarrh, indicates the constant toxic absorption from these diseases. The ragged irregular surface of the adenoid and tonsillar tissues covered with their tenacious secretions, certainly offer an inviting soil for all forms of morbific germs. Hypertrophy of the follicles of the tonsils lead to contraction and enlargement of the lacunæ with retention of the secretions, which easily become infected. Upon the removal of these organs we often find the lacunæ dilated and filled with offensive pus. The effects of enlargement and disease of the adenoid and tonsillar tissues, in causing insufficient respiration, defective oxygenization, and infection of the intestinal tract (thus causing impaired nutrition), are too far reaching in their effects on the organism and its development to be considered here. We have equally as prolific a source of septic infection from the nasal chambers and their accessory sinuses as in the tonsillar tissues. In the various forms of abnormalities and disease of the nasal fossæ, and the often accompanying affections of the adjacent sinuses, we have all the conditions present which favor septic generation and absorption.

Engorgement of the rectile tissues, the various irregularities of the septum, occluding the orifices of the adjacent sinuses with polyps, hypertrophies, etc., are the common forms of obstructions which affect nasal drainage and are thus conductive to putrefactive changes. It is only necessary to refer to these sources of contamination of the blood supply in retarding mental development through imperfect nutrition, as their importance is already recognized.

We may next turn attention to the other phase of the subject, the effects of nasal irritation upon the developing brain centers. In considering the anatomical structure of the nasal fossæ as compared with other organs of the body, it is evident that it must be a fruitful source of reflex irritations in a diseased state. Its erectile tissues are encased in a resistent, bony framework, so that pressure on the nerve terminations may be produced by any slight anomaly of development or variation from injury or dis-

case. The peculiar physiological functions of the intra-nasal tissues requiring constant adjustment to the changing thermal and atmospheric conditions, are such as require a most delicate nervous mechanism. The nerve supply is so rich and so intimately associated with the cortical areas of the brain that it is easy to understand how the psychological functions of that organ may be disturbed by irritations arising in these parts. Through the sympathetic ganglia a very close relationship has been traced between the terminal nerve filaments of the nasal mucous membrane and the vasomotor nerves supplying the arteries of the brain and spinal cord. (White.) Authorities agree that sensory impulses may be transformed into vasomotor impulses, thus affecting the blood supply of the brain. Irritation of the fibrillæ of the trigeminus, which forms the chief source of innervation to the upper air tract, may pass directly to the cerebral cortex through its connections in the medulla. Besides the trigeminus and its sympathetic connection we have the upper region of the nasal fossæ richly innervated by the olfactory, which is similarly associated with the cortical areas of the brain. Edinger says, in his new work on "Comparative Anatomy of the Central Nervous System," that the cortex may be accepted as the location of those psychological functions which are consciously executed after consideration through the use of memory pictures. So is the demonstration of a cortical bundle with the nucleus of a special sensory apparatus of great interest to comparative psychology. Hence, he says, the most important result up to the present time that we have been able to demonstrate is that the first cortical area developed in the animal kingdom was the olfactory cortex. It is an interesting fact in comparative psychology that the oldest cortex represents only a single sensory center, the olfactory center, and that all associations which serve them as a foundation, all memory pictures which they retain, are such as serve especially the sense of smell. The relation between the nasal mucosa and the cerebral cortex through these nervous connections, the trigeminus, the olfactory, and the sympathetic, is so intimate that it is evident that any irritation arising in the intra-nasal spaces from disease or deformity may be transmitted either through the medulla or direct to the higher centers of the brain. As a result of the constant irritation passing into the nerve centers we have, in patients so predisposed, a great variety of reflex disturbances. There is a long list of paroxysmal disturbances whose etiology is directly due, or has been traced, to the diseases of the upper

air tract. Among the most common forms we have sneezing, cough, laryngo-spasm, lachrymation, tinitus, asthma, palpitation and headache. Among the rarer affections may be mentioned corea, epilepsy, neurasthenia, melancholia and insanity. The course of these disturbances, or, as they have been termed, nerve storms, usually takes the path of least resistance. Jackson speaks of them as discharging lesions, especially the epileptiform seizures. If the irritations initiated in the upper respiratory tract are sufficient to cause such violent discharges of nerve energy as we see in asthma, corea, and epilepsy in those who are so predisposed, it may be readily assumed that the same form of irritation in those who have a greater resistance may cause a gradual leaking of energy and a consequent weakening of the central nervous system. When those reflexes which have a physiological purpose become exaggerated and continuous from some form of irritation, they become a source of drain on the energy stored up in the nerve centers. Some physiologists tell us "that any excess of nervous expenditure to one organ over the normal amount which should be furnished is done at the expense of others, sooner or later." A bony spicula or an enlarged middle turbinate may, by constant pressure irritation, cause a weakening or exhaustion of its immediate nerve center with an increasing tax on those centers most intimately correlated, until the whole nervous system begins to show signs of over-taxation. The rapidity with which these symptoms of weakening show themselves depends on the inborn vigor and resistance of the nervous system. The effects of these irritations on the nerve cells have been studied by Hodge, Nisel and others. Every stimulus entering the cerebral cells calls forth a certain expenditure of energy stored therein, and it is plain that a constant over-stimulation means exhaustion sooner or later. Donaldson says that repeated in-coming impulses produce certain changes in the cell bodies, that finally some of them discharge with a force and rhythm of their own, and once taken up by the central cells even slight stimuli diffuse themselves over the entire central system. Goldscheider, in a recent essay, defined the "neurone threshold" to be the degree of excitation of a neurone which just suffices to call forth a fruitful excitation in a neurone to which it is in contact; that is, that sufficient to call forth a sensation, a movement, etc. These studies afford valuable suggestions in reference to the transferrence of excitation from one nerve center to another, and they also indicate what slight peripheral irritations may instigate enormous discharges

of nerve energy. (Barker.) Friedrich has seen a true epileptic attack produced by nasal examination. The importance of normal stimuli to the cortical cells for their healthful growth and development can no longer be questioned. "Gehuchten has emphasized the physiological fact that for the maintenance of absolutely perfect function of the cerebral cells the relation of stimuli to the reparative, nutritive power of the cells must be perfectly adjusted." Edinger, Weigert and others assume that if the stimuli be received in excess a nerve cell is no longer able in the interval of active function to repair the loss sustained by the functional activity; as a result progressive degeneration ensues. Barker says "that it will be the task of the clinical neurologist in the future to decide from his study of a given case as to the existence of abnormal neurone threshold values; further, what neurones are receiving an excess of stimuli, and what neurones are being insufficiently stimulated, and to outline his treatment accordingly. The treatment of nerasthenia, tabes, and many other degenerative processes, is based on these physiological principles."

The writer has tried thus far to indicate in as brief manner as possible those pathological conditions which may exist in the upper respiratory tract, which favor toxic generation and absorption, thus affecting the healthful nutrition of the developing nerve centers; and especially to make clear the effects of irritations arising in this region causing over-stimulation of the brain functions. These are among the most important underlying conditions that so often exist within the organism which produce dullness and irritability. The effects of impaired nutrition and the constant drain on the plastic, immature brain soon manifests itself in impairment of the intellectual processes. Children with catarrhal disease or enlarged tonsils and adenoids soon become exhausted with any mental work. Their perceptions become quickly dulled, their memories become halting and inaccurate, and the reason grows illogical, while their bodily movements indicate restlessness and weariness. The general appearance of these children is so characteristic and their natures are so often perverted that their teachers recognize that some physical defect is retarding their development. Attention has often been called to the defects in physical development of children with enlarged tonsils and adenoids by the various writers on the subject while the mental condition is scarcely noted. The writer has been often impressed by the mental condition which exists in these children. It is a condition which deserves to be more

generally appreciated. The changes which takes place from removing the enlarged tonsillar tissues, or from securing proper nasal drainage, and relieving pressure irritation, is so conspicuous in lifting the cloud from the intellectual field that the change of expression may be noted in a few weeks from a dull, languid, despondent air to one of vigor and happiness. The constant night terrors and dreams which haunt the sleep of these children disappear and refreshing sleep at once follows the removal of the irritation. Where these conditions are allowed to remain throughout childhood and adolescence, their impress becomes a very important factor in determining character. A more thorough analysis, with better data than the writer has been able to obtain, might contribute to the subject of mental hygiene, and give a better insight into those diseased states of the organism which affect mental growth and vigor. Among its most important teachings is that the stages of mental growth co-ordinate with the stages of physical growth and that any impairment to physical growth retards mental growth.

DISCUSSION.

Dr. PRICE BROWN, of Toronto, thinks the effect of adenoids or other hypertrophic lesions in retarding mental development is very evident, and the fact should be noted and emphasized. Two children had been recently brought to him with the statement that while they had been bright and intelligent in infancy, they were becoming more and more dull and stupid. Examination showed the post-pharynx obstructed by adenoids, and the younger child had never breathed through his nose. These facts should actuate the physician to inform the parents of dull children regarding the reasons for such lack of mental development.

GEORGE T. RICHARDS, of Fall River, Mass., recently saw a boy who had become so dull that he refused to go to school any longer, because he realized how backward he was. On restoring nasal respiration the child's mental condition rapidly improved.

Dr. E. E. HOLT, of Portland, Me., thought this showed the necessity for having a school physician, not in general practice, who should be unusually well qualified and broadly educated. He thought every member should use his influence towards securing proper medical supervision at school, as the records which would accumulate as a result of such a system would prove most valuable from a sociological point of view.

Dr. SARGENT F. SNOW, of Syracuse, said that the general practitioner should be impressed with the fact that not only did adenoids exert a bad influence on the general development, but that good ventilation of the olfactory region must be secured.

Mention was made of a boy who was becoming dull mentally, yet examination showed only occlusion of the middle and superior air passages. General medical treatment and simple local applications had speedily changed the whole complexion of the case. He had a case of epilepsy which was undoubtedly due to intranasal pressure.

Fred. G. Cobb, of Boston, thought it was most important for the specialist to ascertain just what pathological states give rise to reflex disorders, and what cases of this kind can be cured.

James F. McCaw, of Watertown, N. Y., cited a case in which he questioned if the apparent mental deficiency were not due to deafness. He was of the opinion that the mental deficiency found in children with adenoids was often not directly the result of the adenoids, but of the associated impairment of hearing.

L. A. Coffin, of New York, also thought the dullness was often apparent rather than real. There was frequently a loss of self-confidence, which was restored by operation. The main factor seemed to be a lack of perception. The child with the stuffed-up nose was engrossed with himself, and could not give attention to his teacher without the exercise of more self-control than he could exert.

Fred. T. Rogers, of Providence, R. I., said that for some years it had been the custom in Providence to place the backward children of the city in special schools. At one time he had examined the children in one school, and about seventy per cent. of them had been found to be suffering from obstruction of respiration or from some high error of refraction. He personally knew of certain of these children who had been taken out of these special schools and returned to the ordinary schools because of the mental improvement resulting from treatment directed to these defects.

Alva B. Abrams, of Hartford, Conn., said that he found patients and physicians seemed to derive much comfort from the statement unfortunately often found in the text-books, that adenoids and similar growths shrink up and give rise to less trouble in later life. While, of course, this was the result exceptionally, it would be better if physicians would forget that this happy termination ever occurs.

Dr. Page, in closing, said that he had met with several cases in which children who had been late in talking had very soon acquired the power of speech after an operation for the removal of adenoids, and from this he inferred that the presence of adenoids sometimes interferes with the development of the speech center.

PAPER:

TUBERCULAR AND SYPHILITIC GRANULOMATA OF THE NOSE.

WILLIAM LINCOLN, M.D.

In the literature of tuberculosis and syphilis of the nasal mucosa not much study has been devoted to the form of tumor described by pathologists as infectious granulomata, and in the few histological reports made of the granulomata it has generally been assumed that the tumors which showed under the microscope the presence of giant cells were to be classed as tuberculous in origin and not syphilitic. I thought it therefore of sufficient interest to report to the Association these two cases which I had under observation at the same time, in which granulation tumors exactly similar, not only in their gross appearance and situation, but in their histological structure as well, had these different specific diseases as their causative factors. Of interest also is the appearance upon the nasal mucosa of a granuloma as an evidence of syphilis, the lesions of this disease observed by rhinologists being almost always ulcerative and not neoplastic.

Case I.—Lakeside Hospital Dispensary, March 6, 1896. E. C. Female, aged forty; unmarried, puella publica. Family history negative. History of disease: Contracted lues five years ago. Treated for a short time and discontinued after disappearance of skin manifestations. One year ago ulcers began to form upon the hard palate. These were sluggish and painless. Six months ago she began to have slight obstruction to free breathing through the right nostril. This gradually increased and was accompanied by occasional slight epistaxis and scropurulent discharge, but no pain. To-day there exists almost complete occlusion of the right nostril and for this condition the patient applies for relief.

Examination.—Shows a mammillated tumor on cartilaginous septum in right nostril, rounded in contour, and measuring 20 to 25 mm. across the base. It is non-pedunculated, arising abruptly from the surrounding mucosa which is apparently healthy. This tumor bleeds easily, is firmly attached upon the septal tissue and presses upon the inferior turbinal. The color is similar to the

surrounding mucosa. A probe passes freely above and below and to the outside of the mass, which is not painful to the touch. No sign of ulceration on the surface or about the edges of the tumor. On the hard palate are several ulcers 5 to 10 mm. across, characteristically syphilitic in appearance, and the scarred sites of many others. Other parts of the nose and throat are normal in appearance.

A piece of tumor removed for microscopical examination shows a structure typical of tubercular granulation tissue with the presence of giant cells.

Physical examination of the chest entirely negative. No subjective or objective symptoms of other trouble.

Treatment K. I. in increasing doses.

March 20.—Ulcers in mouth healing rapidly. Nasal mass decidedly less. Taking 45 gtt. of saturated solution of K. I., t. i. d.

April 10.—Ulcers in mouth healed, leaving scars. Septal tumor appears shrunken and whitish and about one-third of the original size. K. I. continued.

May 10.—Granuloma of septum disappeared, leaving slight depression at its site.

December 15.—Since the last date the patient was seen once or twice at intervals of a month or so, but has not reported now for about six months.

Case II.—Lakeside Hospital Dispensary, May 22, 1896. C. S. Widow, aged 45. Family history: Maternal grandfather died of cancer, otherwise family history good. Patient is nervous and hysterical, has lost considerable flesh. Has occasional night sweats. One year ago had grippe followed by pneumonia.

Disease history: For the last eighteen months patient has been increasingly troubled with nasal occlusion in right nostril, accompanied by quite severe pain in and about the nose. Discharge somewhat profuse and of a muco-purulent character has been present almost all the time. Has been told she has a nasal polyp, and has come to have it removed.

Examination.—Pale red mass situated upon the cartilaginous septum by a broad base, 25 to 30 mm. across. The tumor is sessile, with mammillated surface, bathed in muco-purulent secretion. Tumor presses against the outer wall of the nose, and the probe is passed by the outer surface with difficulty and causes bleeding, but passes freely above and below the mass. The tumor seems imbedded in the mucosa which is slightly raised around it, but not inflamed. No ulceration is seen on the surface or about the

tumor. No other lesion is observable in the nose, mouth, pharynx or larynx. There is no lymphatic swelling. No history of lues.

Physical and bacteriological examination did not reveal tuberculosis of the lungs or elsewhere.

A small piece of tumor removed for microscopical examination shows the ordinary structure of a tubercular granuloma with giant cells, no bacilli could be found in these sections. Administration of K. I. and of K. I. combined with mercury for one month produced no diminution of the tumor, and therefore the whole mass was removed by means of a sharp curette. The scraping was carried well into the surrounding healthy mucosa and down to the cartilage. Three months after this operation nothing remained but a small ridge of indurated scar tissue opposite the middle turbinated bone. The site of the tumor, however, is now a slight concavity covered by apparently healthy mucosa. About eight months after the operation above described the patient returned with an exactly similar condition in the left nostril. The granuloma which has been growing for about four months according to the patient, and which is therefore not so large as the one removed, occupies an exactly similar site on the opposite side of the cartilage. The patient now gives unmistakable signs, both by physical and bacteriological examination of tuberculosis of the lungs. She has lost much flesh, night sweats are very frequent, and muco-purulent expectoration profuse. This second nasal tumor was removed by the cold snare, and a strong solution of lactic acid applied to its site. The patient was also given appropriate remedies and attention for her condition, but died of tuberculosis in four months. The ulcer resulting from the removal of the second tumor proved most rebellious to treatment.

In this case it seemed to me from these later developments that we had in the first instance to do with a case of primary tubercle of the nose, for at the time of its first appearance the most careful examination failed to reveal any tuberculosis of the lungs or elsewhere. The attack of tuberculosis to which she succumbed was of a very acute and virulent type, affecting not only the nose but the lungs and peritoneum as well.

In these two cases we have similar tumors whose sites were identical and giving rise in their first stages to similar symptoms which by physical examination and by bacteriological provings as well as by therapeutic tests, proved to be due in one case to syphilis, and in the other to tuberculosis. The microscopical examination, however, in each tumor was alike. We had the typical gran-

ulation tissue containing here and there giant cells which is described by nearly all authorities as being peculiar to tubercular granuloma. Here, however, in our first case was a granuloma containing giant cells, which was undoubtely due to syphilis.

I have examined a number of articles written by authorities upon these subjects. In one written by Manasse in 1893, there is a very exhaustive report of five cases of syphilitic granulomata of the nose with careful histological study of each case. Giant cells were found by this observer in all of the sections examined

Seiler has also reported two cases of syphilitic tumors in the nose.

Major, in Burnett's System, cites, besides twenty-seven cases of tuberculosis of the nose, collected by Bosworth, seven of which are doubtful, twenty-three cases from various observers, twenty-two of which he believes correctly diagnosed. Since that date, due to more careful observation and histological study, many undoubted cases of nasal tuberculosis have been reported. Notwithstanding this, however, tuberculosis of the nose still remains one of the diseases rarely seen by the rhinologists, and granuloma is one of its less frequent forms.

Herzog in 1893, in a resume of the subject of nasal tuberculosis, published ten new cases and tabulated seventy already reported. Since then the subject has been treated and other cases reported by many observers, notably Hajek, Farlow, Chiari, Woblewski, Theisen, Baurowicz, Koschier, Hasslauer, Wright and others. In Herzog's report a case is mentioned which illustrates very well the point which I consider of importance in my own cases, namely, that we can more certainly determine by physical examination and by therapeutic tests than by histological examination whether these tumors are due to syphilis or to tuberculosis. The case referred to was one in which a granuloma with other symptoms had been diagnosed as tubercular. The tumor as well as the other symptoms, however, rapidly disappeared under the administration of K. I. Herzog, however, states in the same paper that the presence of giant cells in a granuloma may be considered diagnostic of tuberculosis. This conclusion would not seem permissible when the findings in Manasse's cases and my own are considered. Zuckerkandl, in his description of syphilitic lesions of the nose, makes no mention of granulomata with giant cells, although he notes the occasional occurrence of granulation tissue in connection with ulcerative changes. These granulomata containing giant cells he considers as occurring only in

tuberculosis, and asserts that they sooner or later break down into ulcers, causing softening and loss of tissue. The local symptoms of these growths are alike whether the cause is syphilitic or tubercular. The masses bleed readily and cause a hypersecretion of mucus, or, if slightly ulcerated, a thin muco-purulent secretion may be present. Nasal obstruction causes its usual inconvenience, but is accompanied usually by very little pain. Concurrent signs of the specific disease causing the tumor were present in only one of these cases at first, the syphilitic one, but in the second case, the tubercular one, abundant signs of tubercular infection were present at the time of the second tumor. The appearance of the tumors with their mammillated surfaces raised sharply from the surrounding apparently normal mucosa is sufficiently distinctive to assure of their not being confused with other intranasal neoplasm except, perhaps, papillomata, which are sometimes quite sessile. These latter tumors, like the granulomata, are rare in the nose, but their site has generally been noted as on the turbinated bodies, usually the inferior, while the infectious granulomata have in nearly all cases been observed upon the septum. Microscopically, while it is hard to distinguish the specific granulomata from each other, their histological structure is unlike papilloma or any other form of malignant or non-malignant neoplasm.

To differentiate between the granulation tumors due to syphilis and those due to tuberculosis we will be helped as I have stated, more by the results of physical and bacteriological examination than by the examination of the histological stricture. The treatment of tubercular granulomata should be the removal of the growth as completely as possible; this is indicated not only to rid the patient of a focus of bacterial invasion and activity, but also to remedy the local disturbance caused by its presence. The removal is probably best accomplished by means of a sharp curette, being careful to scrape down to the cartilage and well into the surrounding healthy mucous membrane. The syphilitic granulomata will yield to the usual treatment of late syphilis, but surgical interference is, I think, not contraindicated if the growth is sufficiently large to cause considerable obstruction, and this surgical interference may be carried out in conjunction with antisyphilitic treatment.

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PAPER:

THE DIAGNOSIS AND TREATMENT OF NASOPHARYNGEAL SYPHILIS.

P. S. DONNELLAN, M.D.

In looking over the recent literature at my command on the subject I have been struck with the unanimity of opinion regarding the extreme rarity of primary syphilis of the nasopharynx. Parker,[1] in a recent article, states that the initial lesion has been observed as the result of careless instrumentation, especially in the use of the Eustachian catheter, and similar cases are reported by Burrows[2] and others. I have recently seen a case occurring in a married woman in which the chancre was observed behind the posterior arch of the palate on the left side. No antecedent history of syphilis could be obtained, but the characteristic indurated sore, the glandular enlargement, the subsequent appearance of a diffuse secondary syphiloderm, and the prompt response to antisyphilitic medication, cleared up all doubts as to its origin, though it was impossible to discover how the infection had taken place.

The secondary manifestations of nasopharyngeal syphilis are frequently observed in the form of ulcerating papules and mucous patches, usually situated behind the velum, in the vault of the pharynx or on the postpharyngeal wall. At the meeting of the Section of Otology and Laryngology of the College of Physicians of Philadelphia in March last I presented a patient, a married woman, with the following history: She was thirty-five years old and had five children, all living and in good health, the youngest being two years old. She never had any miscarriages. Her husband was living and healthy. A month previous to the time I first saw her she complained of sore throat, pain about the angles of the

jaw, and difficulty in swallowing. She also had general muscular pains with a temperature of 101°. There was no glandular enlargement. On examination her throat presented the appearance of an acute pharyngitis and tonsilitis. She was given one-tenth-grain doses of calomel with saline purgation, ten grains of sodium salicylate every four hours, and the following to be used as a spray at frequent intervals:

℞ Sodii salicylatis, gr. xxx;
Potassii chlorat., ʒij.;
Aq. menth. pip., q. s. ad fʒiij.

Five days later she reported no improvement. A careful rhinoscopic examination was then made with the aid of White's palate retractor under cocaine anesthesia, when an ulcerating papule was found situated high up in the vault of the pharynx. No history of primary sore or of secondary eruption could be obtained. She was placed on a mixture of $^1/_{16}$ grain of bichloride of mercury with 10 grains of iodide of potassium three times daily, and was directed to use black wash locally to the pharynx with a brush at frequent intervals after cleansing with a spray of Dobell's solution. Improvement promptly took place.

The most important and serious lesions are the tertiary forms of the disease. They begin as a gummatous infiltration of the mucous membrane, a favorite site being the pharyngeal bursa. These gummata usually cause but slight subjective symptoms, and for this reason they may escape observation unless the examination of the nasopharynx is thorough and complete. In more advanced cases we find ulcerations of various sizes, sometimes occupying the entire vault of the pharynx and affecting the mouths of the Eustachian tubes and choanæ. These ulcers may be superficial and covered with a grayish secretion, or may be deep excavations with undermined edges and extending to the bone, which is frequently diseased. The subjective symptoms are pain referred to the back of the throat, and occipital headache, worse at night. Tinnitus is frequently observed where ulceration affects the Eustachian tubes and purulent otitis results. Many patients complain of dropping of a blood-stained purulent secretion from the posterior nares, which are blocked, so that nasal respiration is impossible, and mouth-breathing with dryness of the throat causes much distress. It is just such cases that are labeled "catarrh of the head" by the busy practitioner, who either accepts the ready-made diagnosis of the patient, or makes his own after a superficial examination with a tongue depressor and a nasal speculum. Patients with syphilitic

disease of the naso-pharynx rarely present the stigmata of syphilis unless the case is complicated with disease of the anterior nares and the characteristic saddle-back deformity is present. They are frequently, however, of cachetic appearance, especially, as Fischenich[3] observes, those cases in whom there is a profuse naso-pharyngeal discharge which is swallowed during sleep and acts disastrously on the stomach. This authority has recently published (*loc. cit.*) the case histories of forty-nine patients in whom he observed syphilitic disease of the nasopharynx. In fourteen of these cases there were no demonstrable syphilitic lesions of any other organ; in the remaining thirty-five cases other specific manifestations were present. Only the secondary, tertiary, and hereditary lesions were found. He has seen no example of a primary sore in this region. Similar observations are recorded by Lievan,[4] Brenholtz,[5] and others.

I have been impressed with the importance of making a thorough examination of the nasopharynx as a routine measure in every case, even where the subjective symptoms are slight and nothing characteristic is observed in the mouth and pharynx. Isolated specific ulcers at the posterior edge of the velum, high up in the vault of the pharynx, or at the mouths of the Eustachian tubes, are liable to be overlooked unless carefully searched for. In my opinion it is unwise to depend on the statement of the patient, especially regarding the non-existence of a primary sore or a secondary eruption in such cases. When we are satisfied from the clinical picture that the case is one of specific disease, or where an obscure inflammatory condition of the nasopharynx does not respond to the usual treatment adopted in such cases, I think we are justified in instituting a course of antisyphilitic medication before any further developments take place. Occasionally we have to differentiate between syphilitic disease of the nasopharynx and diphtheria, tuberculosis, or malignant disease of the same region. A bacteriological examination of the secretion from the lesion and the therapeutic test of antisyphilitic medication will usually clear up a doubtful case, though the possibility of a mixed infection is not to be lost sight of. De Havilland Hall[6] has reported an instructive case bearing on this point. A man with a syphilitic history presented himself with a gumma in his throat, which was cured by large doses of iodide of potassium. A year later he presented the same symptoms and was relieved by the same means. A few months after he appeared for the third time, but the iodide had no effect, and he ultimately died of malignant disease.

Mounier[7] has directed attention to the occurrence as a late manifestation of hereditary syphilis of ulceration located in the upper part of the pharynx behind the palate, and observed only after careful examination with the rhinoscopic mirror. He reports three such cases—two in young men aged respectively eighteen and twenty-two years, and one in a girl aged eleven years, in whom the true nature of the disease was unrecognized for several weeks. In each a gummatous ulcer was found in the pharyngeal vault. I have had under observation and treatment continuously during the past two years at my clinic two cases of a similar character, occurring in sisters who are now aged respectively fifteen and thirteen years. Except for the minor ailments of infancy and childhood, both had been healthy from birth. The older child had been treated by the family physician for "catarrh of the head" for six months prior to the time when I saw her for the first time, although she had a perforation of the soft palate of three months' standing. An examination with the rhinoscopic mirror revealed an ulcerating gumma in the pharyngeal vault. The younger child presented the same symptoms, except that she had a profuse blood-stained, purulent, postnasal discharge. Rhinoscopic examination showed specific disease of the posterior edge of the vomer. I was able to trace the source of the infection to the father, who had his initial sore followed by secondary eruption one year before the birth of the older child. The mother had no manifestations of the disease. Both patients responded nicely to antisyphilitic medication. The older patient developed a syphilitic osteitis, affecting the alveolar process of the superior maxillary bone, about six months after the true nature of the disease was first recognized. This was intelligently treated at a dental dispensary, with gratifying results. During the past year there has been no recrudescence of the disease in either case.

The treatment of syphilitic disease of the nasopharynx must be thorough and intelligent if we wish to accomplish the best results. The patient must be frankly told the nature of the malady, of the importance of prolonged treatment, of the necessity of being under continuous medical supervision until the disease has been thoroughly eradicated, and be given explicit directions in plain language regarding the risk of contagion to others, by the use of eating utensils, towels, handkerchiefs, atomizers, throat brushes, which are often common property, especially among the poorer families. Antisyphilitic medication must be a combination of local and systemic treatment with mercury in some form, as our chief

reliance, and iodide of potassium as an aid. As to the exact form in which the mercury should be administered, there is much diversity of opinion. It is largely a matter of individual preference. Personally, I am in favor of the hypodermic method, the advantages of which have been summed up by Bulkley[8] as follows: "(1) It is an active remedy which can be perfectly regulated; (2) it avoids disturbing the digestive tract; (3) it avoids publicity in using remedies; (4) it is sometimes surprisingly curative when other measures have seemed ineffective." For this purpose I have used the bichloride in hypodermic doses of one-sixteenth to one-fourth grain, repeating the injections at first every five days, then every week, and when the patient responds to the effects of the drug I lengthen the interval between the injections to two weeks. The dose is increased and the interval lessened if the specific lesions become rebellious at any time. Acting upon the suggestion of Yarrow,[9] I have lately been using the sozoiodol of mercury hypodermically with good results in from one-fourth to one-grain doses. The usual site of the injection is in the lumbar region, the needle being driven well into the muscular tissue and strict antiseptic precautions observed, so as to avoid the risk of abscess formation. Occasionally the hypodermic method does not result in benefit to the patient; then the internal administration of the drug will be indicated. It may be given in the form of the bichloride in one-sixteenth-grain doses, with or without iodide of potassium from ten to fifty grains, three times a day. The latter is particularly indicated in the tertiary forms of the disease. Again, it may be found that inunctions of mercurial ointment will produce better results.

As regards the duration of the treatment, my plan is to give the selected mercurial as long as the disease shows activity; then to give it in interrupted courses of about two months each, with intervals of about four months, over a period of two years, during which time the patient is kept constantly under observation. The local treatment of nasopharyngeal syphilis is of the highest importance and must be carefully carried out. I use Dobell's solution or some of its modifications with the postnasal syringe to cleanse thoroughly the diseased area, and instruct the patient in its use so that the treatment can be carried out twice daily at home. I follow the alkaline douche with one of black wash, also applied with the postnasal syringe, and direct the patient to apply it by means of a postnasal swab to the ulcers, if they can be reached. Frequently I insufflate, with a powder-blower, a mixture of equal

parts of calomel, acetanilid, and boric acid over the affected area. In cases where there is much pain and dysphagia, I have found the local application of orthoform of benefit. Denuded or loosened bone must be carefully searched for with the probe, and curetted or removed. In addition to the antispecific medication the patient should be placed in the best hygienic environment, and careful attention given to bathing, exercise, open-air life, and diet. If the blood-count shows a deficiency of hemoglobin, as is frequently the case, iron in the form of Blaud's pill in five-grain doses three times a day will be of value. Arsenic may with advantage be combined with the iron in doses of from one to five minims of Fowler's solution.

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DISCUSSION.

Dr. George L. Richards, of Fall River, advised that a thorough trial of antisyphilitic treatment should be given in cases in which a diagnosis of syphilis has been made, before resorting to any surgical interference, for the chances were that such interference would then be found unnecessary.

Dr. L. A. Coffin, of New York, referred briefly to two desperate cases of syphilis in the pharynx.

Dr. Charles F. McCahan, of Aiken, S. C., said that in his experience most of the cases of tuberculosis of the throat are secondary, and he believed that the same was true of tuberculosis of the nose.

Dr. Price Brown, of Toronto, said that a gentleman had been referred to him by an oculist some six months ago for nasal treatment, with the statement that the man had specific keratitis and nose showed that the trouble there was traumatic, not syphilitic. He subsequently returned with a perforation of the soft palate, evidently the result of the formation and breaking down of a gumma. The history showed that he had become syphilitic ten

years before, but after having been treated for a time had married. Both children were healthy, and the wife is said to be healthy. Under antisyphilitic treatment the condition of the palate had been kept in check.

PAPER:

AN OPERATION FOR PROMINENCE OF THE AURICLE.

THOMAS R. POOLEY, M.D.

Operations for purely cosmetic reasons are not very often performed—perhaps not so often as they might be with good results. The purpose of this short communication, therefore, is to briefly relate one which I did with a fair amount of success in a case in which this common deformity existed to a somewhat unusual degree.

The operation, which I did on both ears, is described by the late Dr. Edward T. Ely, of New York, in Knapp's *Archives of Otology*, Vol. X., 1881, p. 97, who modestly remarked: "I do not know whether this is a new operation for the deformity in question or not." I have not been able to find any account of the operation elsewhere, and, I believe, the credit for its introduction belongs entirely to him.

The patient I operated upon was an actress, twenty-eight years of age, who objected very much to the deformity caused by undue prominence of her auricles, which she said was a decided drawback to her securing engagements in her profession. At first I declined to operate, but her constant importunities at last won me over, and I consented to undertake the improvement of her personal appearance. I operated upon both ears, but at an interval of a few days, and followed closely the method described by Ely in the first operation he did.

On August 6, 1900, I operated upon the left ear, as follows: An incision was made through the skin, along the entire length of the furrow formed by the junction of the auricle with the side of the head posteriorly. This was joined at each end by a curved incision carried over the posterior surface of the auricle, and the skin and subcutaneous tissue included by these incisions were dissected off. Two incisions, nearly parallel to the former ones, were then carried directly through the cartilage, and an elliptical piece of the latter, measuring about one-eighth of an inch by one-third of an inch, removed. The piece of skin was considerably larger than

this. The wound was then united by seven interrupted sutures of black silk, four of which were passed through the skin only, while the three others were passed through both skin and cartilage. Owing to the natural folds of the cartilage it was found impossible to secure perfect coaptation of the anterior portion of the auricle, and a small space was here left to heal by granulation. This operation was done without a general anesthetic, by using hypodermic

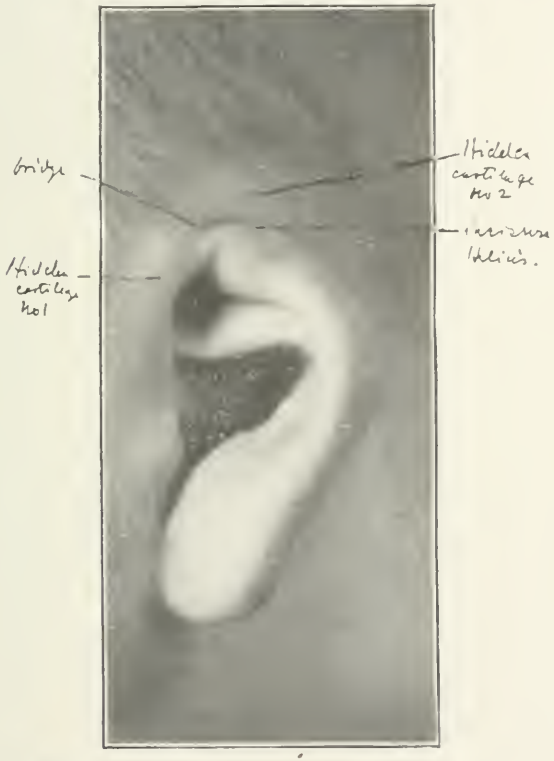


Fig 1.

injections of cocaine and the frequent instillation of cocaine over the wound during the progress of the operation, and was attended with a good deal of pain to the patient. Before beginning the operation the hair was shaved from the neighborhood of the ear and the meatus stuffed with cotton to prevent the entrance of blood. A strip of iodoform gauze, absorbent cotton, and a firm bandage were then applied. Strict aseptic precautions were adhered to throughout the entire procedure.

The healing was favorable, the wound behind the ear healing

by first intention, that in front by granulation. The sutures were removed about the fifth day. A few days later the other ear was operated on by the same method, but a somewhat larger piece of cartilage was removed and the anterior wound was a little larger. In this case, also, the wounds healed favorably; the posterior one *per primam*, the other by granulation; there was, however, on this side slight tenderness with some swelling of the cervical glands.

August 27.—She was discharged from the hospital, both wounds posteriorly healed, but a small button of granulation tissue on the anterior part of the right auricle.

The patient was well satisfied with the result, but I regret to say that I have not had an opportunity to see the case since the patient's dismissal from the hospital, as she went to Europe shortly after, and I have not seen her since. I had a picture before and after the operation taken, which I am sorry to say I have mislaid, which showed very well the position of the auricles before and after the operation.

So far as one operation goes, I can highly recommend this operation of Ely's to your consideration. I do not know whether any of you have done it or not, but if so, I should be pleased to hear what you may have to say of the method.

In conclusion, I may add that Dr. Ely operated on the second ear of his patient in a somewhat different manner:

Holding the auricle so that the light from a window shone through it, he transfixed it with a scalpel and rapidly excised a piece of cartilage of the desired size and shape, together with its overlying skin. Additional skin was then removed from the posterior surface until the wound seemed to correspond in extent to that made at the former operation. Twelve sutures were used, of which three were passed through the cartilage on its anterior surface and one on its posterior surface, while the others were passed through the skin only. Complete union by first intention was not secured behind, but the healing was equally satisfactory. Ely adds that he did not like the method so well as the first one employed.

DISCUSSION.

Dr. M. D. Lederman, of New York, reported a large sebaceous cyst in which, after the removal of the cyst, the auricle had been bent over on the external canal. He had accordingly made a V-shaped incision over the mastoid and removed a portion of skin; primary union had taken place. Also a case of a negro upon whom he operated for a keloid growth on the lobe of the ear.

Dr. T. Passmore Berens, of New York, spoke of a case in which the protrusion of the ear was caused by an excess of cartilage of the concha. In that case he had excised a piece of

cartilage nearly half an inch in its broadest part. The wound was closed simply by a buried suture, and was dressed with collodion, binding the auricle to the side of the head with a gauze bandage. At the end of the fifth day the wound had healed, but the bandage was worn for eight days longer, and by that time the ends of the cartilage had united. The operation had been done two months ago, and at the present time the extra fold of skin left after the operation had nearly disappeared. He was opposed to making an anterior as well as a posterior incision.

Dr. J. F. McKernon, of New York, had seen a very similar operation done ten years ago by Dr. George Abbott, of this city, except that three sections of the cartilage had been taken out without affecting the skin anteriorly at all. The result had been very good. Within the last three years he had seen another case also yielding a good result.

Dr. Pooley said that he felt sure that any operation which did not involve a considerable dissection of the cartilage would not succeed, but whether one should go through the entire concha or not was a question.

PAPER:

EMPYEMA OF THE FRONTAL SINUS: SOME OBSERVATIONS ON ITS TREATMENT.

GEORGE L. RICHARDS, M.D.

The observations herewith presented are based more on my own experience than on an exhaustive survey of the literature of the subject and the reports of cases, and form, therefore, probably only a very limited view of a large subject, since the arc of the circle which any one man's experience subtends is necessarily very small; nevertheless, the sum total of human knowledge is made up of individual contributions.

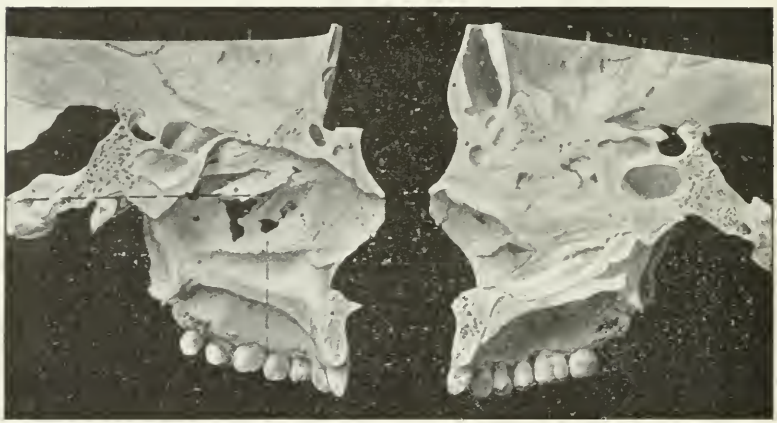
A brief review of the anatomy of the frontal sinus seems necessary in order to deal properly with the subject of treatment. The frontal sinus varies in its position, in size, and in the thickness of its walls. It is not developed in early childhood, but appears about the age of puberty, probably from an extension of the ethmoidal cells into the frontal bone, and attains its full development around the twenty-first year. The manner of its development may account for the great variation in its size, and for the relation which it bears to the anterior ethmoidal cells.

Normally, the most dependent portion of each sinus opens downward into the nose, through a duct called the fronto-nasal opening. This duct varies in diameter from one-twelfth to three-

sixteenths of an inch, and in length from one-half to three-quarters of an inch. Its outlet is in the infundibulum, a term applied to the upper and anterior portion of the hiatus semilunaris, where it is bounded externally and behind by the bulla ethmoidalis, in front by the processus uncinatus of the ethmoid, and internally and above by the anterior third of the middle turbinate bone.

The natural openings of the antrum of Highmore and those of the anterior ethmoidal cells are in the hiatus semilunaris, but be-

Fig. 1.



Right and left halves of the same skull. In the right there is a good-sized frontal sinus, the walls of which are thicker below the supra-orbital access to the fronto-nasal canal, and at the same time have been at the ridge than above, but an opening below the ridge would have given easy most dependent part of the sinus. In the left half the inferior turbinate and the anterior end of the middle turbinate have been removed. The natural opening into the maxillary antrum is indicated by the vertical dotted line, while above the processus uncinatus is plainly visible. The horizontal dotted line points to the infundibulum, which is prolonged into the frontal sinus as the fronto-nasal canal. In this case a probe or canula could probably have been passed into the frontal sinus. (Author's collection.)

hind the infundibular opening of the fronto-nasal duct. Between the frontal sinus and the infundibulum the fronto-nasal duct is separated by thin walls from the anterior ethmoidal cells, while in front of it are usually several small cell spaces, called by Hartmann the frontal cells of the ethmoid; of these he describes three —an anterior, an outer, and a posterior. These cells have very thin walls, sometimes almost as thin as paper. The direction and position of the infundibulum and fronto-nasal duct being depend-

ent upon the size and development of all these boundary structures, it is easy to understand how difficult it may be in many, or even in most instances, to satisfactorily reach the sinus, for purposes of exploration or treatment, through the natural opening.

The anterior wall of the frontal sinus is relatively thick; its posterior wall less so, but still quite thick; while its thinnest wall is over the orbit, a portion of the roof of which it forms, and at which point the wall may be very thin. Its extension outward and upward is very variable, being on an average from three-fourths to one and one-fourth inches above the fronto-nasal opening, and about the same distance outward. It extends backward over the roof of the orbit about half an inch. These are average measurements, but by no means constant. The two sinuses do not usually connect, but may do so; this very rarely occurs, except as a result of disease. They are also variable in their relation to one another, one sometimes being much larger than the other, or one sinus may entirely fail. The division line may be so far to one side as to allow of the wrong sinus being opened at an operation, or it may run diagonally, as in one of my specimens, and there may be septa dividing the sinus into compartments.

What danger has the collection of pus in these sinuses? What are the chances of cure and the best methods of bringing this about? As to the danger, it seems to me that so far as life is concerned this is relatively small. This statement I regard as correct, in spite of the fact of deaths being reported from chronic empyema of the frontal sinus; since anatomical anomalies, secondary infection after operation, or unusual virulence of the pus would account for these, as reports seem to show. We have all discovered cases of chronic empyema of the frontal sinus, with a constant discharge of foul pus, in which the general health was really very good, and the danger to life by the presence of the pus almost *nil*. I recall one such case, in which the pus discharge had probably existed for years without any great disturbance of health. Relief was sought on account of the nasal obstruction and the foul odor. Polypi were cleared out, the middle turbinate removed, and, this failing to cure, the sinus was later opened externally. It was found to be filled with pus and a low grade of granulation tissue, which latter bled most freely on being curetted. After the thorough removal of all diseased membrane recovery was prompt and uneventful, and there has been no recurrence of the trouble.

If one considers the anatomical relationship, and the fact that nature usually seeks an outlet through the path of least resistance,

it will be found that there can be no outlet which nature is likely to force except downward, or downward and forward, or outward through the wall of the orbit; that is, nature will be most apt to force her way out in the region of the ethmoidal and frontal cells, or through the roof of the orbit, in which latter place it is probable that spontaneous evacuation sometimes takes place.

Fig. 2.

Two halves of the same skull. In the right half there is no frontal sinus above the supra-orbital ridge, diploëic bone being found in its place. Just underneath the ridge, at the inner angle, is seen an opening; this leads to a small sinus which communicates with the nose through the usual fronto-nasal canal, and is large enough for an empyema. The sinus is present in the left half. It is about the average in vertical extent, but outwardly extends but a short distance. In this specimen opening over the roof of the orbit would have come upon the dura. (Author's collection.)

Aside from the symptoms of pain and headache in the neighborhood of the sinus, and the complaint of nasal obstruction, the diagnosis is made by inspection of the discharge, which appears underneath the middle turbinate or between it and the septum, and by exclusion of the other possible sources from which this pus might come. Pressure upward on the wall of the orbit will usually elicit pain, though this is not constant. Disease of the antrum and

of the sinus may coexist, and in many cases it may be necessary to make an exploratory incision into the antrum to exclude that as a possible source of the pus. I have several times opened into the antrum in the canine fossa, under cocaine, to determine the presence or absence of pus. Puncture underneath the anterior end of the inferior turbinate is equally efficient for diagnosis. When antrum and sinus are both diseased it is likely that one has infected the other. The antrum is usually the first to be operated upon under these conditions, as the discharge from the frontal sinus may take care of itself after the antrum is healed. If the exploratory puncture of the antrum has been negative, we then have the anterior ethmoidal cells and the frontal sinus as the possible sources of the pus. The diagnosis here may possibly be very difficult. Transillumination, while by no means decisive, has seemed to me of some value as a diagnostic measure. It certainly is, so far as antrum disease is concerned; and in two of my frontal sinus cases the information furnished by transillumination was positive and accurate.

In the text-books one is taught how to carry a probe through the hiatus semilunaris and the infundibulum directly into the frontal sinus. In practice, with a swollen mucous membrane and an enlarged middle turbinate, the whole of which may have been bathed with pus for a long time, and where polypi may also be present, this may be extremely difficult, or even impossible. The observer may think that the probe is in the frontal sinus when it has passed into some one of the frontal or anterior ethmoidal cells, or even when it is in the superior meatus. The first thing to do, then, in any case in which pus is evident, is to clear away any obstruction, such as polypi, that may be present. As a rule, it will be necessary to remove the entire anterior portion of the middle turbinate. This also applies to those cases in which the suppuration is acute—such cases as are not infrequently seen following the grip, and in which the drainage is obstructed by the swelling of the mucous membrane and its underlying connective tissue.

These acute cases tend to get well if the drainage is free enough; and on their first discovery the middle turbinate should be removed and the drainage made as free as possible. After this is done it is frequently comparatively easy to find the track up to the frontal sinus, and with the aid of a silver or hard-rubber tube, properly bent, to wash out the sinus, and in a relatively short time to bring about recovery. The proper curve of the tube is obtained by first passing a long silver probe and then copying its curve. In

cases of this class the question of an external operation ought seldom to occur, and the diagnosis is usually not a difficult one to make or to differentiate from ethmoiditis or antrum disease, since

FIG. 3.

Specimen somewhat broken, but showing a good-sized frontal sinus, with very thick anterior wall. The ethmoidal spaces are very large, have extremely thin walls, and communicate with the cavity of the sphenoid. All of the turbinates and the infra-orbital wall have been removed. In case of chronic empyema, the entire frontal, ethmoidal, and sphenoidal areas might have been affected. In that case no single operation would have been thorough enough to have eradicated all of the disease. It is specimens like this which probably account for the long and unsatisfactory course which empyemas in this region sometimes take. (Author's specimen.)

the attack is acute, is accompanied by pain over the eyes and forehead, and the whole clinical picture is one that admits of comparatively little doubt as to the trouble. I have recently had an acute case of frontal sinus empyema, in which after removal of the middle turbinate it was easy to pass a curved canula into the sinus.

Daily syringing produced a cure in six weeks, and after some months there has been no recurrence.

In that large number of cases in which the purulent discharge has lasted a long time, and in which the formation of polypi has been brought about from the constant draining of the pus over the structures, and all the adjacent ethmoidal cells are very likely more or less involved, the question of treatment becomes less easy to decide. These cases are of all degrees of severity. An example of one of the severer ones may make my meaning clearer.

Some three years ago a patient was referred to me by an oculist on account of some trouble in the nose following typhoid fever. She had complained for several years of severe headaches, for which she had been treated by many physicians. She finally drifted into the hands of an oculist, who, finding that glasses were of no avail, examined the nose. To his surprise, he found that breathing through each nostril was difficult, and that there was a constant discharge of pus from each side. Thinking that the cause of the headaches might be in the nose, he referred her to me for treatment. Treatment was commenced by first removing at several sittings large numbers of mucous polypi from each nostril. I then made exploratory punctures into each antrum without finding any pus. The pus discharge diminished very much from the left nostril, but was no better on the right. I next removed each middle turbinate. Still the headaches were about the same, and the discharge of pus was constant; nor did syringing into the sinus, which was done fairly easily on the right side, less so on the left, seem to accomplish much. I then did the infra-orbital operation on the right side, in the angle formed by the eyebrow and the root of the nose, and opened freely down into the nose. Fluid pus, without granulations, was present. Thinking that I had now accomplished drainage by external and internal means, I allowed the external wound to close in a short time, and did not carry any drainage-tube down into the nose.

There was improvement for a while, but the pus discharge continued, and after a few months I again operated, this time on both sides, in the same locality, and found pus in each sinus. The opening into the nose was enlarged with large curettes, and iodoform gauze wicking passed through, followed in a few days by good-sized fenestrated rubber drainage-tubes passed clear into the nose; these latter were retained for four weeks. The external openings closed; the openings into the nose, in spite of their size, became so

small that a silver probe could not be passed through without pain; still the pus discharge continued.

After a few weeks more she was again operated upon. This time the curette was used with greater vigor, so as to break up all of the cells in the region of the outlet; and larger drainage-tubes were put in each sinus. The amount of pus at this time was pretty small in the right side, but she had been complaining greatly of pain in it. Healing took place as before. The tubes were retained several weeks, but still the pus continued. She was allowed to go home, but as the pain was complained of as much as before, and the pus discharge was considerable, she was operated on again two months later.

This time the incisions were made higher up on the forehead, above the supra-orbital ridge, with the hope that the curette could be passed down into the nose more directly and the operation be a thorough success. It was found that there was still pus in the left sinus, but that the right one had completely closed and had become filled with new osseous growth. This fact would seem to harmonize with the statement of Hajek, that the pain is sometimes worse on the sound side, since, in spite of the healing, the pain did not disappear. At no time did the two sinuses communicate. The wound again healed, and I was under the impression that I had accomplished a cure, as relief was obtained for a time; but something over a year later she came to me with the statement that there was still some slight pus discharge from each nostril and an occasional swelling at the inner angle of the right eye, with considerable throbbing pain in the region of the temples, especially on the right.

At her own request she was again operated on. Both frontal sinuses were found to be closed with new bone, and were therefore not opened throughout their whole extent. The natural opening into the nose was reopened and made as large as possible, and all anterior ethmoidal cells that could be reached were broken down and destroyed. The right antrum was opened, but contained no pus. An attempt was made to open the right sphenoid sinus, but it was not very successful. Large drainage-tubes were carried down into the nose, and the external openings closed. The throbbing pain ceased, and the general pain after operating was less than usual. The rubber tubes were removed in five days. On the right side a curved silver tube was carried from the external incision down into the nose and retained three weeks. She is improved in every way, though still under treatment, and the pus

discharge from the nose has not entirely ceased. That an absolute cure has been obtained is doubtful, as improvement has followed all previous operative procedures. Considering the number of operations the cosmetic results are very good.

I am inclined to think that in this case I have had an empyema not only of the frontal sinus, but of all the adjacent ethmoidal cells, possibly extending as far as the sphenoid, and that the earlier operations failed to open sufficiently for efficient drainage some one or more of these cells; and if I were to draw any lesson from my own failures in this particular instance, it would be to suggest that when an external opening is made the anterior ethmoidal cells should be destroyed with the curette as far back as it can be made to reach when used from above; and if the cutting portion is kept backward and outward, or outward and forward, there is but little risk of injuring any important structures. If turned toward the center line it will be possible to injure the lamina cribrosa, which is from 14 to 20 millimeters only from the root of the nose and about on the same level, though sometimes deeper.

The foregoing is an extreme case; but can any of the chronic cases be cured by intranasal operative methods? Hartmann thinks it will but seldom occur that they can. In the chronic cases, how long shall the operator be content with having secured fairly good drainage; for it is only exceptionally that the element of severe pain comes in, as in the case just cited? According to Hartmann, the external opening should be made when, after a fair trial of intranasal drainage, the discharge continues and there is still pain. Most of the chronic cases get a certain amount of relief after the removal of the middle turbinate, and are then somewhat loath to consider the question of an external operation, fearing the deformity and having a certain dread of the length of time required for healing; though the latter, I am sure, would be very much shortened if a sufficiently large opening were made down into the nose at the time of operation; and the deformity, when the operation is done at the inner angle of the eye, under the infra-orbital ridge, is nothing. The washing out of the sinus, even after the removal of the turbinate, is still difficult, since the outlet is small; and if polypi or granulations are present in the sinus no cure will ever be effected until an external opening is made. Various solutions are used for syringing into the sinus. Personally, I have had better results from corrosive sublimate, 1:10,000 to 1:15,000, than from peroxide or any of the other solutions usually advocated. To be sure, the corrosive sublimate irritates sound tissues

and is sometimes painful, but it does more good than any substitute. It should be followed by an alkaline douche through the nasal cavities and pharynx, to offset its irritant effect upon the sound tissues. Protargol, in 2 to 5 per cent. solution, has proved of service in the hands of several observers.

I should say, then, that after spending a reasonable length of time in the attempt to gain proper intranasal drainage by syringing and douching, the question of an external operation should be presented to the patient and he be allowed to make the choice. He will be very likely to ask if we know that there is pus in the frontal sinus, and if a cure will result; and to both of these questions we may be in doubt as to the answer. Hartmann reports a case in which, after opening the frontal sinus, no pus was found, but on further exploration pus was found in the frontal cells. I once opened the frontal sinus in a case of pus discharge which I had at first supposed to be purulent ethmoiditis, having found no pus on exploratory puncture of the antrum. The pus discharge not disappearing after removal of the middle turbinate, I concluded that the sinus must be infected. It was opened and no pus found. Healing took place in four or five days, and no unpleasant results ever came from the operation. The pus, without doubt, came from some unopened ethmoidal cells or from the frontal cells in the region of the fronto-nasal canal.

Will a cure result? This is the other question certain to be asked. Sooner or later, yes; but how long it will take will depend on the extent of bone involved; and this is a question difficult to determine before the sinus has been explored. Diseased bone is notoriously slow to heal so long as any portion of the disease is left, since so long as there is any left it is liable to break down and form pus. Then, again, I have found the tendency of the canal in the nose to close to be a constant source of difficulty. To illustrate:

A case of empyema of the antrum was opened, cleansed, curetted, cured. Pus appeared in the nose. The middle turbinate was removed and the discharge found to come from the frontal sinus. The sinus was opened thoroughly, and, having in mind previous experiences, the opening into the nostril was made, as I supposed, sufficiently large. A drainage-tube was retained two weeks, and the opening then allowed to close. Five weeks later there was a swelling at the region of the external wound, and the sinus, or at least a portion of it, was found filled with pus. Under cocaine the walls of the sinus were thoroughly curetted and an

endeavor made for weeks to bring about healing, but without avail. An ether operation was again done, more bone cut away, the sinus curetted in its whole extent, and the opening down into the nose very much enlarged, a drainage-tube reinserted, and the opening allowed to close. The case was discharged, apparently well, but returned some weeks later with pus as before. The sinus was curetted, drained, irrigated with corrosive sublimate, and at last healed. This last time I was able, with the aid of a silver tube, to prevent the opening into the nose from closing until the bone was apparently healthy. Some months have now elapsed without any return of the trouble, and there is no deformity.

In another somewhat similar case, which also combined antrum and sinus trouble, a gold tube was made and kept in the external wound for a long time, until the last vestige of pus had disappeared.

So far, then, as the external operation is concerned, it must be allowed that the question is by no means so simple as it at first might be supposed, since the so-called radical operation is not always certain to result in a cure.

At the meeting of the Laryngological Society of London in February, 1901, this subject was discussed, and the weight of the argument seemed to be in favor of the more conservative methods of dealing with these cases intranasally. Dr. St. Clair Thomson thought that we should be slow to claim a complete cure in these cases, and recorded a case in which, although the operation had been done two years before, the patient still had to syringe her nose three times a day. The pus, he thought, had come from the ethmoidal cells rather than from the frontal sinus, as the fronto-nasal duct was quite obliterated before he allowed the sinus wound to heal. This, however, only confirms my statement that in the chronic cases we probably usually have to deal with an inflammation of the ethmoidal cells as well as of the frontal sinus.

At this same meeting Dr. Herbert Tilley said that in cases in which only a drop or so of pus showed itself at the end of each fronto-nasal canal he did not consider himself justified in advising a radical operation, and that the nose should be merely cleansed once or twice daily and nothing else done.

Sir Felix Semon replied in answer to the question, "When ought one to perform a radical operation in these cases?" that it was a great achievement to be able to diagnose these cases better and to treat them more successfully than in the past. Over a practice of twenty-five years devoted to special work he had seen

plenty of these cases, and, so far as he knew, very few of them had come to grief prior to the discovery of the modern forms of treatment. There had been a few cases with threatening symptoms,

FIG. 4.

Specimen with good-sized accessory cavities, in which operation in any of the places recommended by various authors would have reached the sinus and allowed abundant room. On the right side is indicated the site for the opening above the orbital ridge. In this specimen there are several septa in the sinus floor and large frontal cells; and had there been an empyema it might have been necessary to do one of the radical operations in order to entirely eradicate the disease, though the opening below the ridge could easily have been enlarged sufficiently to give access to the entire sinus area. Below on the left side is indicated the site for operation on the maxillary antrum, while the small openings on the right side show somewhat of the boundaries of the antrum. (Author's collection).

puration still continued after the performance of the radical operation, further operations were necessary, and the patient finally was not much better off than before. In his opinion, it is a matter deserving very great consideration as to whether or not the discovery of a little pus coming from the frontal sinus demands a

but they were and are very few. He had seen cases in which supradical operation in every case; and the surgeon is bound to tell the patient that the big operation occasionally leaves some deformity.

Dr. Lambert Lack thought that the indications for external operation are rather indefinite. If the symptoms are of only slight purulent discharge, he thought the cases best left alone. The middle turbinate should first be removed, the anterior ethmoidal cells opened, and the approach to the infundibulum thoroughly cleansed. If this failed he operated externally, endeavoring always to obliterate the sinus, as the only certain method of obtaining a cure. He thought that many cases reported as cures by intranasal operation are really only cases of ethmoidal cell disease.

As a whole, this discussion seems to me to be leaning rather to the extreme of conservatism. It is certainly much more conservative than the other extreme, viz., the operation which Hartmann describes, of removing the whole of the anterior wall of the frontal sinus (Die Verödung der Stirnhöhle durch Abtragung der ganzen vorderen Wand). This would doubtless produce a cure, but it is a question whether our American patients would care for the operation. Hartmann himself is opposed to such an operation on account of the great deformity which results, and says that it does not seem to be necessary, as healing can be brought about through the establishment of a free communication with the interior of the nose.

In the final analysis the question of operation must depend in each individual case upon symptoms, such as recurring attacks of pain and cerebral irritation, which suggest dangers to the organism from septic absorption; and upon the judgment of the operator and the confidence reposed in him by the patient. In many persons the question of confinement, or the length of time they will be kept from work, will have a large influence, and they will prefer to endure the discharge of pus which is not producing alarming symptoms rather than be kept from their daily vocation long enough to produce a cure. I have such a patient at the present time. The daily washing keeps her comfortable; there is no retention of discharge; and she thinks she cannot afford to lose the time required for the radical operation. In another case removal of the polypi and middle turbinate has so much improved all the conditions that the radical operation is declined on the ground of lack of urgent symptoms. The drainage is good, the pain on pressure over the eyebrow has disappeared, the odor though still present is

much less, and there is but little discharge. As this patient is over seventy years old, and his cardiac conditions are poor, I am limited to intranasal methods of treatment.

If the external operation is decided upon, where shall the opening be made, and by what means? The question of scar is one not to be lightly passed by, and I am decidedly opposed to such an operation as Hartmann describes, in which, after first making an incision and cutting away the bone in the line of the eyebrow, but underneath the ridge, he then opens at right angles down to the eye, lays aside the soft parts, and cuts away the frontal cells, taking care that he does not remove any of the important muscles or soft parts of the eye. This is undoubtedly effective in laying bare the sinus, but leaves an unnecessarily large opening. He does this only when the simpler operation has not opened the cells sufficiently or brought about a free enough communication with the nose.

From my own experience I prefer always to make the opening between the supra-orbital notch and the root of the nose and underneath the ridge. Whereas the wall of the sinus is comparatively thick at this point, the sinus itself when opened is as roomy as at any place, and the bone opening is easily enlarged upward as far as the upper border of the ridge, and outward, so as to give a sufficient amount of room to enter a fairly good-sized curette and explore every part of the region. While the fronto-nasal canal is easily accessible at this point, it is at the same time also the most dependent portion of the sinus. So long as the upper border of the supra-orbital ridge is left the resulting deformity is practically nothing, as the new growth of the eyebrow takes care of the scar.

Before beginning the operation the post-nasal space can be plugged, to prevent the swallowing of blood. A string should be attached to the plug, one end being brought out through the free nostril and the other out of the mouth. After shaving the eyebrow and properly preparing the surface a circular incision is made from just inside the supra-orbital notch and along the lower third of the eyebrow as far as the root of the nose or a little below. The periosteum is laid back, the bone bared, and an opening made down to the sinus at the center-point of the incision. The sinus being opened and explored with the probe, the external opening is still further enlarged as in the individual case may seem necessary. When this is done sufficiently a probe can be passed downward into the nose through the natural opening and its direction noted. This opening is then enlarged with the curette, so as to give all

the room that is needed, more of the bony wall being cut away if required and in whatever direction needed; and, bearing in mind my own experience, I should urge upon the operator to make a larger opening into the nose than he thinks he needs—in fact, the largest opening possible, especially backward and outward, so as to avoid any danger of injuring the lamina cribrosa. Use small curettes at first, and larger ones if needed; those with curved shanks are preferable. The whole area of the sinus which can be reached is to be curetted and its ramifications followed up. The extent and vigor of the curetting will depend upon the condition of the mucosa and the presence or absence of granulations. As far as possible, all of the ethmoidal cells in the immediate vicinity should be opened. When using the curette in the fronto-nasal canal or in the ethmoidal region the little or index finger should be kept in the nostril as a guide, the middle turbinate having been in all cases previously removed.

I have tried gauze wicking of good size as a means of keeping the fronto-nasal canal open, but do not like it, as it is very painful to remove. Drainage is best attained by means of rubber tubes slightly fenestrated, one end of which presents at the external wound and the other out of the nostril. These may be changed every other day, the new one being readily attached to the old one by carrying a needle with a long thread twice through each one and leaving the threads, cutting out the needle at the eye. The old tube is then drawn down, the new one follows it, and the threads can be cut off. The advantage of putting the thread through twice and then leaving it long is, that if there is any interference on the way and the rubber pulls the threads might pull out and the following tube be lost; but if the threads are sufficiently long the following tube will not be lost, and the first one can be drawn back in case the second tube will not follow, and a smaller tube can then be used. These tubes should be retained as long as may be necessary, certainly two or three weeks. After that time if a tube is required it is better to use one of silver, properly curved. At the time of operation a stitch is put at each side of the wound, leaving an opening sufficiently large for the drainage-tube. In cases which have lasted but a short time, if the opening into the nose is very large, it may do to close the external wound; personally, I prefer to keep it open for a while, when if the case progresses well the tubes can be removed and the opening allowed to close. As the incision is a curved one, when the tube is finally withdrawn the tendency is for the opening to close perfectly, leaving only a

slightly depressed scar, completely covered by the eyebrow and not noticeable in any of my cases except on close inspection. When the opening is made on the forehead above the ridge there is more likelihood of an unsightly scar if it cannot be closed at once and perfect apposition obtained; there is also more likelihood of a depression than when the opening is made at the angle of the eye. The only possible advantage of opening above is that the opening down into the nose is rendered straighter. I think, however, that this advantage is more theoretical than real. If the operator were certain that he had removed all of the diseased mucous membrane, and that the outlet into the nose was sufficiently large, the external wound might be closed at once; of this, however, one cannot be sure.

In case the cavity is filled with granulations, Hartmann would take off the frontal wall. As already cited, one of my cases was as full of granulations as it could be, and yet it healed in less time than any of the others; so that it does not seem to me to be necessary to take off the frontal wall.

Considerable swelling of the loose tissue about the eye always follows any external operation, but lasts only a few days.

The after treatment will depend upon how thoroughly the disease can be eradicated at the first operation. In many cases recovery will be prompt and satisfactory; in others final healing will be tedious and long delayed, and there may be some pus discharge for some time. The pus discharge may come from some of the ethmoidal cells, which in long-standing cases are almost always involved. Re-operation may be necessary, even when the first operation was apparently absolutely thorough. The principle which must be our guide is, remove all diseased bone and mucous membrane that it is possible to remove, provide free drainage, quired for a cure varies, according to the degree of severity of the disease, from a few weeks to several months.

Beside the operations described there are a number of other procedures for the cure of empyema of the frontal sinus which bear the names of their originators, and which I shall briefly describe, since they appear frequently in literature, and there is sometimes some confusion of terms.

The Operation of Nebinger-Praun. The essential point of this is the wide opening of the anterior frontal sinus wall. An incision is made from the naso-frontal suture along the orbital border of the supra-orbital notch. The anterior bony wall is laid bare, whatever is necessary, first of the nasal, and then of

the frontal bone, being chiselled away. A vertical incision, 4 to 6 cm. long, is next made, following the border of the frontal vein. Bone is now chiseled away corresponding to the breadth of the sinus, the horizontal portion being laid bare. After the horizontal

Fig. 5.

Specimen showing large frontal sinus extending backward and outward over the entire roof of the orbit. In case of empyema, operation underneath the supra-orbital ridge and between the supra-orbital notch and the root of the nose would give ready access to the whole interior of the sinus and to the fronto-nasal canal as well. (Author's collection.)

and have as little remaining deformity as possible. The time re-

portion is laid bare, the purulent contents removed, and the wall curetted, the opening into the nose is enlarged. Nebinger recommends draining the sinus at the place of junction of the horizontal and vertical cuts.

The Operation of Jansen. The chief feature of this operation is the removal of the inferior wall of the frontal sinus, and, in very large sinuses, partial resection of the anterior wall. A curved incision is made underneath and parallel to the eyebrow from the lateral border of the orbit to the side wall of the root of the nose. After loosening the periosteum the superior wall of the orbit is laid bare. The inferior wall of the sinus is next removed. In the case of a very large sinus the inferior border of the anterior wall is also removed. The diseased mucous membrane and granulation tissue are removed with sharp curettes.

While this method gives free access to the floor of the sinus, the opening into the nose is not so readily attained as by some of the other methods. Having seen some cases some time after the Jansen operation, I am not especially pleased with the ultimate cosmetic results; in one case, particularly, the eye on the operated side seemed to sag.

Method of Ogston-Luc. To open the sinus and ethmoidal cells an incision is made along the inner third of the orbital wall, extending about 1 cm. until the root of the nose is reached, the periosteum laid back on one side toward the forehead and on the other from the orbit, and the sinus opened a little to the outward, from the median line and mostly above the orbital ridge. After opening the sinus an opening is next made into the ethmoidal cells, and after establishing a wide communication between the sinus and the nose a drainage-tube is carried down into the nose, and the external wound at once closed.

This operation has many advocates, and is frequently performed. When the external wound is at once closed it is probable that the resulting scar is very slight. In those cases in which it becomes necessary to keep the external wound open for a time—and these are quite common—it does not seem to me likely to produce as good cosmetic results as the infra-orbital operation I have described.

Method of Czerny. Czerny makes an osteoplastic flap, enlarges the opening into the nose, tampons with iodoform gauze for a sufficient length of time, and as soon as healing is brought about lays the skin flap, with its attached lamella of bone, on the side of the original wound. This is said to produce good results, without deformity.

Method of Kuhnt. This consists in the removal of the entire anterior frontal sinus wall and the entire diseased mucous membrane, including the upper portion of the fronto-nasal canal. A

horizontal incision is made along the inner two-thirds of the supra-orbital ridge; then a vertical upward incision is made at the inner angle of the first incision. After pushing back the soft parts and the periosteum the entire anterior wall of the frontal sinus is removed with chisel and bone-cutting forceps. The bone edges are left smooth and all septa in the sinus are removed. The entire mucous membrane is next removed from the sinus and from the upper portion of the fronto-nasal canal. A drainage-tube is then inserted and the external wound closed with sutures. The after treatment consists in the daily syringing of the sinus with sublimate solution. The stitches are removed on the sixth or seventh day.

Röpke has modified this operation so as to make a wide passage from the floor of the sinus to the ethmoidal cells, clearing out the latter as far as necessary and then packing the cavity with iodoform gauze. When both sinuses are affected the vertical incision is made in the middle line, and the anterior walls of both sinuses, together with the division line, and the prominent portion of the nasal process of the superior maxilla are removed.

The cosmetic results are said to be good, there being marked depression in only one of Röpke's cases. Double vision was present in three cases, but passed away after a while. Unless the mucous membrane is entirely diseased it would seem almost superfluous to remove every portion of it, since it must all be reformed again for the proper nourishment of the interior of the sinus unless the sinus is to be obliterated. In this latter case I fail to see how there can help being some deformity after such an operation as this.

Operation of Killian. This consists in chiseling and curetting the frontal sinus, with temporary resection of the nasal bones.

Operation of Spiess. Spiess opens the frontal sinus intranasally with the drill and the end of a flexible shaft, under the X-ray.

This operation would seem to be a rather difficult one to do, and not entirely devoid of danger, since where there are so many sinuses and cells the X-ray picture might easily mislead. I have seen some of the X-ray pictures of the operation in Dr. Spiess' clinic. Both Dr. Spiess and Prof. Moritz Schmidt regard this mehod of operating as valuable and certain, since it gives a large opening into the sinus without external opening. So far as I know, this method has not as yet been followed by other operators, at least not to any extent.

It would be much simpler if these various operations were described and known according to their anatomical characteristics rather than by the names of their real or fancied originators. Too many things in medicine and surgery are described in this manner. It seems to me that it is sufficient, and far better, to describe a procedure as such, rather than as A.'s, B.'s, or C.'s. The reader is then enabled to know what is being described without first looking up a biographical dictionary of medicine.

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PAPER:

EMPYEMA OF THE RIGHT MAXILLARY, ETHMOIDAL, AND SPHENOIDAL SINUSES WITH SUDDEN BLINDNESS OF THE LEFT EYE. OPERATION. RECOVERY OF SIGHT.

T. H. HALSTEAD, M.D.

It has long been recognized that that important accessory sinus of the naso-pharynx, the middle ear, perfectly analogous to the other accessory sinuses of the nose, is the cause or starting-point of meningitis, brain abscess, and pyæmia, but comparatively little attention has been given to the sphenoidal and ethmoidal sinuses as points of infection and invasion of the brain as well as of the orbit.

The plate of bone separating the sphenoidal sinus from the sphenoidal fissure is of variable thickness, in some skulls in my possession the thickness in places being less than the paper this is written on. Beaman Douglas has recently called attention to the frequent presence of additional air sinuses in the lesser wings of the sphenoid, making still closer the connection between the air-containing sinuses of the nose and the nerves and vessels passing through the sphenoidal fissure; and there pass through this fissure the third, the fourth, the ophthalmic division of the fifth,

and the sixth nerves, some filaments from the sympathetic, and the ophthalmic vein. Thinnest of all, however, is the plate of bone which separates the sphenoidal sinus from the optic foramen, transmitting the optic nerve and the ophthalmic artery.

The barrier between all the accessory sinuses of the nose and the eyeball, the nerves supplying the eye muscles and the optic nerve, is so slight that acute suppuration, empyema, necrosis, and new growths of the sinuses, constantly met with by every rhinologist, must be very frequent factors in the causation of various eye lesions. Holding the skull between one's eye and the light and estimating the thinness of the bone separating the sphenoidal sinus from the optic foramen, one must be struck by the infrequency of reported cases of optic neuritis and blindness resulting from sphenoidal suppuration and abscess, and it must be due to the fact that this sinus and its diseases have been greatly overlooked or underestimated as to their ability to occasion eye diseases.

During the past three to five years, and more especially in the past year, very many cases have been reported showing this intimate relation between sinus disease as a cause and eye lesion as a result, and, without doubt, the sinuses will very soon receive the general recognition they deserve.

The case which I report is of more than usual interest because the suppuration of the various sinuses of the nose was on the right side and gave occasion to no ocular symptoms until suddenly blindness developed on the opposite or left side.

Mrs. G. M., æt. twenty-one years, was brought to my office at 11 A. M. on Nov. 1, 1900, by the late Dr. U. H. Brown. The patient had been under Dr. Brown's care for some time for a catarrhal affection of the right side of the nose, the last treatment being two days before, when the nose was sprayed. The night before I saw her with him she had been to a dancing party, feeling perfectly well and without any symptoms referable to her eyes. Dr. Brown, who was an ophthalmologist, had never, up to this time, had occasion to examine her eyes. This morning, however, she awakened at 6 o'clock, and at once discovered that she was totally blind in the left eye, and early that morning called at his office. He found the following condition of the fundus as taken from his case book: "Exudation into sheath left optic nerve, veins enlarged and tortuous, arteries diminished in calibre. Vision, quantitative perception of light. Nerve head seen best

with + 7 D. Left pupil dilated and responds but little to ophthalmoscopic light reflex."

She gave the following history. For about two years she had had some nasal catarrh and had at various times been treated for it by different physicians. Six months ago, while in the Adirondacks, contracted a more than usually severe "cold in the head." The right side of the face at the beginning of it was swollen and tender, quite acute pain over and around the right eye, a profuse, yellowish, and odorous discharge from the right side of the nose. Because of this persistent pain, discharge, and odor, she left the woods and went to Utica for treatment, but remained there but a few days, as she thought she was not benefited, and returned to the Adirondacks, where she remained most of the summer. During the summer there was a continuous discharge of odorous yellow pus blown from the right side of the nose, with more or less postnasal discharge of the same character, nasal obstruction on the right side, more or less pain over the right eye, especially forenoons, insomnia requiring trional every few nights, general malaise, and occasional chilliness. There was neither pain nor discharge on the left side. On returning to the city in the early part of September, she placed herself under Dr. Brown's care. The Doctor stated that in the two months he treated her she had a very profuse discharge of pus coming from the right middle meatus, but he had not determined its origin. He had never seen any at any time on the left side.

The patient and her husband both remarked that while formerly she soiled during a forenoon five or six large handkerchiefs, this morning less than one had been soiled, and most of this had come from the left side, almost none from the right.

On examining the nose, I found the following condition: *Right side*—general deviation of the septum to the right, greatest deflection being in the upper part. Inferior turbinate swollen. Middle turbinate could not be seen because of the deflected septum and swollen inferior turbinate; pus covering the latter and coming from above. *Left side* was clear, septum slightly concave, no enlargement, swelling, or pressure of the middle turbinate against the septum or outer wall. No pus in the superior or middle meatus, but there was some on the floor under the inferior turbinate. Slight amount of pus on the posterior wall of the naso-pharynx, but it could not be traced to any definite point. Tonsils slightly enlarged. After using a 10 per cent. solution of cocaine and cleaning away the secretion, I was able to see the

anterior edge of the right middle turbinate, and on pressing the septum over got a fairly good view of the middle meatus, finding that the pus was coming from under the middle turbinate. The probe could not detect bare bone, and in a very few minutes the swollen mucous membrane again obscured the middle turbinate. With electric transillumination, the right maxillary sinus was completely dark, with no pupillary glow, whereas the left antrum was very translucent, the pupil being bright. Both frontal sinuses very translucent. Tenderness on palpation over the right antrum, at the inner canthus, and above the right eye. No fulness to be detected. No pain or tenderness on the left side, but a feeling of fullness and pressure back of the left eyeball. The left pupil was widely dilated, did not respond to reflected artificial light thrown into it, but contracted when light was thrown into right eye, showing that the third nerve was not involved. Unable to distinguish objects or count fingers held in front of the eye and could perceive light only out of the outer angle. Distinct exophthalmus, the eye being very perceptibly pushed forward and slightly outward. Right eye unaffected. Temperature, 99.4° F. Pulse, 82. I made a diagnosis of empyema of the right antrum, right ethmoidal and sphenoid sinuses, with a recent rupture or breaking through of the septum between the two sphenoidal sinuses, allowing the pus to distend the left sphenoidal cavity, causing either a bulging of the outer wall of the sinus, giving rise to a pressure on the optic nerve passing through the optic foramen, or else an actual perforation at this point into the cranial cavity beneath the dura mater, probably the former. Advised an immediate opening of the right sphenoidal sinus, to give drainage and relieve the pressure in the left sinus, as the danger of permanent blindness or of fatal meningitis was great should this relief not be quickly afforded. Dr. Brown concurred in the diagnosis and proposed treatment, and asked me to assume charge of the nasal and sinus part of the case. Dr. Elsner was asked to see the patient with us, and also concurred.

The patient was extremely nervous, constantly and involuntarily catching at my hand during this examination, and Dr. Brown, who had seen a good deal of her during the past two months, assured me that it would be practically impossible to do any operation under cocaine, and that a general anæsthetic would have to be employed. I felt, however, that her assistance and cooperation were essential, and two hours later, under cocaine anæsthesia, and, to prevent hemorrhage as far as possible, the

application of a 10 per cent. solution of suprarenal extract, the operation was done. Owing to the deflection of the septum, and the lack of control of the patient, the electric trephine could not be used with any degree of safety. The anterior end of the middle turbinate was first removed by Hartmann's conchotome, Grünwald's forceps, and the snare. The deviation of the septum and the free flow of blood, which the suprarenal only slightly controlled, made this exceedingly difficult. Bryan's chisel and curette were used to enter the posterior ethmoidal cells, and, having gone through these, continued until the sphenoidal sinus was entered. It was impossible to see much during the latter part of the operation, because of the free flow of blood and the increasing disquiet of the patient. The chisel, which was used both to enter the sinuses and to press over the septum, was kept well to the middle line and entered the sphenoidal cavity 2¾ inches from the lower margin of the nostril. As it could not be seen, I satisfied myself with the probe that it was entered and desisted from going farther; the opening made was then enlarged. A little pus was found on opening into the posterior ethmoidal cells and later in the sphenoidal, but the hemorrhage was so profuse that not much was to be seen. In an hour the patient went home, and at 8 P. M. was resting quietly. The next day the discharge of pus was most profuse, the eye symptoms no better and no worse. Steam inhalations and hot Seiler's solution was being employed every two hours. From this on, all symptoms began to improve, perception for light increased, and she was able to distinguish objects seen at the outer corner of the eye. On November 8th, a week from the operation, she could count fingers held directly in front of the eye, the nasal breathing was much improved. Dr. Brown's note: "Vision $^{20}/_{100}$, disc less woolly and more distinct, vision improved, field better." Pus was coming freely from the right side of the nose, none from the left. In the naso-pharynx it was mostly from the right side. Two weeks from the time of the first operation I removed the remaining part of the middle turbinate and was able to probe and syringe the sphenoidal sinus. There was steady though slow improvement in the sight. On November 27th, pus in the right middle meatus being copious, antrum dark under transillumination, I opened into the antrum through the socket of the first molar which was extracted for the purpose. It was found full of pus of the odor of hydrogen sulphide. This was washed out, the cavity packed with iodoform gauze and dressed daily for a week, after which time a Myles drainage tube was put in

place. The discharge now almost entirely ceased from the nose. The antrum was, after this, syringed twice daily with boric-acid solution, and gave her little trouble. On November 30th, Dr. Brown, who died a few weeks after this, made his last record of the eye condition: "Nerve still pale but more clean-cut edge. V $^{20}/_{70}$ +. Blood-vessels fuller."

On January 2, 1901, the nasal symptoms had almost entirely ceased, there being very little muco-purulent discharge into the naso-pharynx; no odor, nasal breathing good, washing from the antrum clear, but is still wearing the tube. Opening into the sphenoidal sinus free and easily seen. No frontal headache, general health much better. Can read large type with left eye, pupil contracts much better than it did, still some exophthalmus. She now came under the care of Dr. F. W. Marlow for her eyes. His report at this date is: "R V, $^{6}/_{6}$; L V, $^{6}/_{24}$. Not improved by glasses. The pupil acts well, but sluggishly to light. Perimeter shows marked contraction of the field of vision, most marked in the lower half of the field. Colors are recognized, but the field for color is much contracted, especially at the inner and lower portion of the field, where it approaches the fixation point." At his suggestion, Dr. Stephenson applied the mild continuous current, 1½ milliamperes, the positive pole over the eye, the negative over the occiput. Strychnia, which she had been taking for some time, was continued.

March 27th.—After irregular treatment of electricity her vision was $^{6}/_{12}$ partly, the size of the field for both white and colors being not materially changed. The antrum appearing normal, the antrum tube was left out with a view to the sinus closing.

On May 17th, being six weeks since the removal of the antrum tube, the following condition was noted. No pus to be seen anywhere in the nose or naso-pharynx, though patient says there is in the morning a "dropping" in the throat. The openings into right sphenoidal sinus are still free and easily seen, and no bare bone is to be detected with the probe. The opening made through the alveolus into the sinus appears closed, but a very fine probe can be passed through it. She is entirely free from headache, a thing which she had never been free from in two years previously, and the insomnia of two years' duration has entirely disappeared. General health greatly improved, and a gain in weight from 108 to 125 pounds in the six months since first operation. One can detect, on close examination, that the left

eye appears to be more prominent than the right. The pupil reacts well to light and much better than a month ago, though not normally. She can read ordinary type with the left eye, but has to make an effort. Dr. Marlow's report as to the eye at this date is: "L V, $^{6}/_{18}$; color vision normal; pupils equal, left responding actively to the light, apparently as well as the right when the eyes are exposed to the sky, but much less than the right to the ophthalmoscope light reflection in the dark room. The left eye is slightly prominent, this being chiefly evidenced by a more extensive exposure of the sclerotic between the lower margins of the cornea and the edge of the lower lid. Ocular movements apparently normal, but the cover test and also the Maddox rod both revealed a moderate degree of exophoria (4°) and R hyperphoria (1°). The opthalmoscope shows marked uniform pallor of the disc and diminution or both arteries and veins, the veins being at least as much reduced in size as the arteries. In the right eye the veins and arteries have a relative size of 2 to 1; in the left eye of about $1^{1}/_{2}$ to 1. There are no white lines along the blood-vessels, and the margins of the optic disc are clearly defined."

There are several interesting features in this case. The sudden occurrence of blindness in the left eye without previous apparent implication of the left sphenoidal cavity would make it appear that the septum between the two sides had but recently broken down, or else that the orifice of the right sinus had become suddenly entirely occluded and so caused retention in the left side which may have been diseased for some time. Either supposition would explain the sudden blindness due to bulging of the sinus wall against the optic nerve, causing blindness. Although the blindness and the discovery of the choked disc were practically simultaneous, at the same time optic neuritis might have existed for some time prior to the onset of the amaurosis, as blindness frequently supervenes suddenly or with great rapidity during the course of optic neuritis of long standing. There were, however, no ophthalmoscopic signs that the neuritis had been of long duration, and besides this was the fact of the prompt improvement in vision following the evacuation of the pus and relief of pressure. There were also signs of a recent change in sinus conditions, viz., a sudden diminution in the discharge from the right side coincident with the amaurosis, and the appearance of pus in the left nasal cavity. These facts all seem to point to the supposition that the blindness and swelling of the optic disc were

due to pressure of accumulated pus in the sphenoidal cavity upon the optic nerve passing through the optic foramen.

It would be interesting to know in which sinus the disease began, whether in the antrum, the ethmoidal, or sphenoidal. There is a history of frontal headache, insomnia, and postnasal discharge existing for at least eighteen months prior to the occurrence of the signs of acute suppuration of the antrum, and I am inclined to think the ethmoidal and sphenoidal disease antedated that of the antrum. I have no doubt but that the deviation of the septum, interfering with nasal breathing and sinus ventilation, had a great deal to do with the causation of the sinusitis in the beginning.

While I have opened into the sphenoidal sinus many times, this was the first time I felt the necessity of opening into it at the first operation, ordinarily removing the middle turbinate and entering the posterior ethmoid and later the sphenoid. In this case it seemed imperative to lose no time in relieving the pressure, as permanent blindness or the patient's death might result from any delay. The deviated septum and the patient's excessive lack of self-control made the operation doubly difficult and extra hazardous. It would have been a much simpler matter to have opened into the left sphenoidal sinus instead of the right because of the deviation of the septum, and I am aware that had the case terminated badly some criticism might have been made for not having done this. The objections to it were that the doing of it meant the removal of a perfectly healthy middle turbinate, the wounding of the ethmoid, and the probable subsequent necrosis of this normal structure. Whereas, by operationg on the side from which the disease had its origin, I hoped to cure or improve the ethmoidal necrosis which existed, as well as the sphenoid, and by giving good drainage to this relieve the pressure of the pus in the left cavity, and the subsequent history of the case appears to have borne out the wisdom of this course.

DISCUSSION.

Dr. Neil J. Hepburn, of New York, said that in Dr. Halsted's case the blindness might have resulted from a thrombosis of the central retinal vein. Unless the pressure had occurred very suddenly it could hardly account for the very sudden onset of the optic neuritis of that grade. An ordinary optic neuritis coming on from pressure would disclose a certain progressive loss of vision. He had witnessed one case of operation on the sphe-

noidal abscess by an eminent surgeon, in which the cavernous sinus had been accidentally opened. The hemorrhage had been most startling, but the surgeon had retained his composure, and had succeeded in controlling the bleeding by packing in a way which has led the eye-witnesses to have less dread in the future of the occurrence of such an accident.

Dr. Talbot R. Chambers said that many cases of frontal sinusitis, if taken in hand early, might be aborted before the occurrence of the purulent stage. The accumulation of mucous in a frontal sinus was the first step of a sinusitis, and could be readily evacuated. When entering the sinus and removing bone, it was better to use an instrument which could punch out an opening. A case was mentioned in which at one sitting he had taken away the inferior turbinate and the covering of the sphenoidal sinus, and opened the whole space into one cavity. By this procedure the mucous secretion could be removed in certain cases at an early stage.

Dr. Sargent F. Snow said that two years ago he had had a case quite similar to the one reported by Dr. Halsted. The difference was that the blindness had been a week in coming on. There had been so much pressure that the vitality of the bone had been lowered, and the operation had been done for the most part with a Buck's ear curette slightly bent near the ring, a very safe instrument for such work.

Dr. Redmond W. Payne, of San Francisco, said that Dr. Richard's paper and exhibition of skulls called to mind some of his own work. He had endeavored to determine the number of anomalies met in this region. In the formation of the sinus itself was to be found the reason for many failures. In some of the sinuses that he had examined the depth of the sinus had run back over the orbit almost to the optic foramen, both plates being exceedingly thin. In some instances in which the sinus had run back deeply it had been divided into several compartments by bony septa. Such cases showed at once the impossibility of eradicating the disease by any opening below without an attempt to reach it with the curette. The external wall should be removed, either entire or in section, thus exposing the seat of the disease, and permitting thorough exploration. If the mucous membrane lining the sinus had undergone fungous or polypoid degeneration, and two-thirds of it only had been removed, the patient would not be permanently cured. Many of these cases of chronic suppuration would go on for years. Not many cases of meningitis had been reported in this connection, but as there were many cases of meningitis following chronic suppuration of the ear he saw no reason why the same should not occur in cases of sinus disease.

Dr. Charles W. Richardson, of Washington, spoke concerning operative intervention in cases of purulent discharge from these sinuses. When pus issues from a closed cavity the proper course is to insist upon opening the sinus and removing the diseased condition found there. It seemed to him that conservatism

was not at all in place where there was a purulent discharge from these sinuses. In a sinus so accessible as the frontal there should be no question as to the wisdom of operative intervention. A very slight purulent discharge might be connected with very extensive disease. In other regions of the body in which operative intervention is much more dangerous, the general surgeon does not hesitate, and he could not see why the rhinologists should be so backward about operating. No one hesitates about opening an abscess of the mastoid. These operations should be done promptly and as thoroughly as possible.

Dr. R. C. Myles said that free drainage is far better than anything else. He has always been opposed to over-curetting of these sinuses, for he is of opinion that by such treatment the period of convalescence is greatly prolonged or indefinitely postponed. By such curetting the mucosa and periosteum are removed, and the re-formation of these tissues not only takes a long time, but is apt not to re-form in many crevices, and this leads to a permanent discharge. Extensive destruction of the ethmoid cells or of bony tissue intended to protect the frontal sinus usually made the patient's condition worse than before the operation. According to his experience the best way of obtaining free drainage is by removing the anterior end of the middle turbinate, and also the median wall of the anterior ethmoidal cells. This alone, with proper irrigation, will effect a permanent cure in the majority of these cases. It is his practice to remove the anterior wall of the sphenoidal cells rather thoroughly, never curetting the upper wall. In a few months the opening would close by contraction of the mucous membrane, but it could be quickly and almost painlessly opened with a bistoury. In the unfavorable frontal cases the great obstacle was the nasal process of the superior maxillary bone. Entrance above the orbit was the straightest way for removing this process. This could be done well only by making the opening above the supraorbital ridge. He formerly did the infraorbital operation, and had experienced great difficulty in getting rid of this hard, bony process. In his opinion, all cases of acute empyema of these cells should be carefully studied before attempting operations. In chronic cases conservatism should be given a trial. Frequently irrigation would be sufficient, or the mere extraction of a tooth, and it should be tried first, care being taken to explain to the patient that it was in the nature of the preliminary operation.

PAPER:

EMPYEMA OF THE FRONTAL AND ETHMOIDAL SINUSES AND ORBITAL ABSCESS.

THOMAS R. POOLEY, M.D.

The following case seems to me worthy of record, for divers reasons, which I will enumerate and dwell upon to some extent after reporting its history and the operation done for its radical cure:

The patient, a young gentleman of 19, was admitted to my hospital March 25th, at 5 P. M., suffering the most intense pain in and around the right eye and over the entire side of the head.

The eyelids both upper and lower were enormously swollen, red, and shiny, so that they could hardly be opened to inspect the eye, especially as they were exquisitely sensitive to the touch. Inspecting it, however, there was found to be some chemosis, most prominent at upper inner angle—slight ptosis and some restrictions of the movements of the eyeball inwards and upwards. In the upper inner angle just above the insertion of the tendon oculi was a minute fistulous opening, but there was no discharge from it. His temperature was 104° F. and pulse 120 and there seemed to be some mental disturbance, which, however, might be due to the narcotics he had taken to relieve the intense pain. The following history was obtained from his mother's statement.

Ever since he had scarlet fever, six or seven years ago, this eye has been affected, being at times painful and watery, but no severe trouble occurred until six years ago, when while staying in Boston he felt his eye uncomfortable, and by the time he reached home the lids had swollen a little. A diagnosis of erysipelas was made and hot applications applied. He was treated by several physicians, but there was no improvement.

Dr. O. F. Wadsworth was called in consultation and made an incision below the margin of the lower lid. This caused subsidence in the swelling of the lids to a minimum extent, but some pain and swelling still remained. Four years ago he was operated upon in the Massachusetts Eye and Ear Infirmary by Drs. Standish and Jack. This operation, which seems only to have been

evacuating the contents of the swollen sinus, was followed by temporary relief, the swelling remained in the inner angle, and a permanent fistula. For about a year past he had suffered very little inconvenience until the present trouble. A few days before I saw him he was treated by Dr. Coe who referred him to me.

Taking into consideration the antecedent history, in conjunction with the present condition, I was led to make the following diagnosis. Chronic empyema of ethmoidal and frontal sinuses, acute exacerbation and abscess of the orbit. For immediate relief of the patient's pain, I made with a Graefe's knife an incision into the fistulous opening, but no pus escaped, nor did it do any good. The following day, with the assistance of Drs. Myles, Spence, and Cook, the house surgeon, I proceeded to operate, the patient being fully under ether; the skin shaved and the region of the wound washed with green soap, then with ether, and bichloride 1- 5000.

An incision was made beginning at the outer third of the orbital ridge to the internal canthus, thence downwards and inwards along the nose to the lower border of the orbit, carefully avoiding the superior oblique muscle. The dissection was made close to the bone, the periosteum reflected fully exposing the upper and inner surfaces of the orbit. An examination showed a fistulous opening in the anterior wall of the frontal sinus through which a probe could be passed into its cavity. The fistula thus discovered was enlarged by means of chisel and gouge so as to admit free access to the sinus, which was found to be filled with polypoid granulations which were thoroughly removed by means of a sharp spoon. The sinus seemed to be dilated much beyond its usual size. The ethmoidal cells were then explored and found to be soft and infiltrated with pus. The incision was then carefully carried along the inner wall of the orbit and an exploration of the cavity made. It was done partly by dissection with a scalpel, using mainly the handle thereof. Upon entering the depth of the obit a large cavity of pus equal to one or two drachms suddenly escaped. The opening was made through the anterior ethmoidal cells into the naso-frontal canal and the infundibulum and down through the nose. On one end of the probe was an eyelet through which a thread was passed, attached to a soft rubber catheter which was then drawn through, carrying the tube with it, one end coming through the opening in the sinus, the other through the nose. The ends of the tube were tied together to keep it in place. The cavity and antrum were packed with strips

of iodoform gauze. The wound was carefully packed around the tube and five sutures taken in the wound, over this a wad of absorbent cotton, and the whole held in place by a firm roller bandage.

Immediately following the operation there was subsidence of the swelling of the eyelids and the following day the temperature was normal.

During his stay in the hospital, about three weeks after the operation, there was a continued and uninterrupted progress toward recovery. The wound was dressed twice daily after irrigation being made into the opening in the frontal sinus, and through the drainage tube into the nose, there being used at different times therefor saturated solutions of boric acid and normal salt solution and occasionally a $^1/_{10,000}$ solution of bichloride.

The first drainage tube introduced was allowed to remain in position for about two weeks, it was then removed and a Myles frontal sinus drainage tube introduced in its place, to which was attached at its upper extremity a thread which came out the wound, and to the lower another which come out through the inferior meatus of the nose. This tube, with which you are no doubt familiar, has a flange at its upper extremity which projects from the opening into the wound and is introduced into the nose about as far as the superior or middle nasal meatus.

At the time of his discharge from the hospital, the wound with the exception of the point where the drainage tube entered, had healed by primary union. An examination of the nose made at this time by Dr. Myles, showed a large number of nasal polypi. After his discharge from the hospital the patient came daily to my office in order to have his wound dressed, which dressing consisted in packing the frontal sinus first with iodoform and afterwards with sterile gauze, and in irrigation through the nose and drainage tube. This was continued for about four weeks, at the end of which time the drainage tube was removed through the nose, and for some time after its removal irrigation of both the frontal sinus and nose were continued until at the expiration of about two months after the operation the wound had entirely healed.

An examination of the nose made just before he discontinued treatment showed that the nasal polypi had entirely disappeared.

At this time, as you will see by looking at the patient, there remains some edema of the upper lid and a slight scar which is somewhat drawn inward at the inner angle. The patient is now

quite free from inconvenience or trouble of any kind and has returned to his usual avocation.

The feature in this case which is the most interesting and worthy of comment, is the sudden invasion of an acute exacerbation upon a chronic sinusitis of both the frontal and ethmoidal sinuses with severe constitutional symptoms, *i. e.*, intense swelling of the lids, chemosis, protrusion of the globe and restricted movements of the eyeball, clearly pointing to the presence of an abscess in the orbital cavity. This no doubt was superinduced by an extension of the inflammatory process which began in the one or both sinuses, extending into the orbital cavity, and which was clearly diagnosticated before the operative procedure was begun, and rendered immediate surgical interference imperative.

Another interesting point to which I wish to call your attention is the apparent connection in the effection of one or both sinuses with scarlet fever, in the paper which I read before the Eastern Section of this Society, in Philadelphia, February 17th, 1900. I reported a case of necrosis and empyema of the frontal sinus, which was also attributable to this cause. The patient had been otherwise in good health until the age of 16 years, when he had an attack of influenza, followed in two weeks by scarlet fever, resulting in the development of an abscess in the orbital region associated with considerable orbital cellulitis. I mention these two cases in connection because of the apparently causal relation existing between this exanthema and affections involving both the orbit and the accessory sinuses. This is, perhaps, not to be wondered at when one considers the inflammation of the mucous membrane of the throat and nose so characteristic of this disease.

In the case which we are now considering, it was the neglect, or rather inefficient treatment of the chronic process, which resulted in the severe acute symptoms which ensued when the patient came under my notice, and suggests the necessity for a more radical operative procedure in all cases where the inflammatory process manifests itself by external swelling in the upper inner angle of the eye, with tenderness and swelling of the lids, which is a sure indication of an empyema of the ethmoidal and probably of an implication of the frontal sinuses as well.

The mere opening of such swelling and evacuation of pus can only give temporary relief, and permanent relief is only to be obtained by an operation which will permit of a free exposure and thorough exploration of the condition of the frontal and eth-

moidal sinuses and the establishment of free drainage through the nose.

Without such interference a fistula may exist, as it did in this case for years, and brain complications may ensue at any time.

Upon the different methods of operating to accomplish this result, I have dwelt more at length in the paper to which I have already referred (loc. cit.).

A very interesting fact in this case to which I wish to call your attention is the complete and entire disappearance of the numerous nasal polypi after the operation, which goes to show what I think has been pointed out before, that the appearance of these polypi is dependent upon disease of the ethmoidal cells. The specially interesting and intimate connection existing between the disease of the nasal sinuses and the ocular affections, has attracted the attention of both oculists and rhinologists, and it would, perhaps, be difficult to add anything new in this particular. Cases of both frontal and ethmoidal disease of the sinus nearly always exhibit some ocular manifestations, but it is particularly those cases with the involvement of this organ which come under the care of the ophthalmologist. I have observed cases in which neuritis and subsequent atrophy of the optic nerve have been the result of such processes by an extension of the infection along the sheath of the optic nerve.

An interesting article bearing upon this question has been recently published by Broeckaert (*Revue Hebd. de Laryn. d' Otol. et de Rhin.*, Jan. 5th, 1901). In this article he enumerates a number of ocular complications, sometimes only slight, passing troubles, sometimes serious, very often grave complications, such as inflammation of the orbit, paralysis of the muscles, narrowing of the visual field, atrophy of the papilla, iridocyclitis, panophthalmitis. These conditions have been the object of numerous studies, and I do not intend here to dwell upon them as they are enumerated in the article to which I have referred, and which are easily explained on the ground of the close proximity of the eye and the sinus, as in this case it is easy to conceive that affections of the anterior ethmoidal cells may easily extend to the orbit, since ethmoidal sinusitis is almost always accompanied by frontal sinusitis. We all know, too, how often disease of the nose and adjacent cavities may react upon the eye by the nervous route, the trigeminal, and cause phenomena which are purely reflex. As is shown by the author I have already quoted, even iritis and opacities of the vitreous and retinal detachment follow in the wake

of these affections. Without any attempt to more than merely suggest by these brief enumerations the dangers which may result by extension of the diseases of these accessory sinuses to the organ of vision I leave the matter for your further study and observation.

In conclusion, I wish to express my sense of obligation to Dr. Myles for his most able assistance and valuable suggestion which contributed so much to my success in this case.

A NASAL CONDITION AFFECTING THE OCULAR MUSCLES.

HEBER NELSON HOOPLE, M.D.

The thesis I wish to advance is that faulty pressure within the nose can cause asthenopia of both the ciliary and external ocular muscles. To be more specific, I wish to show that mere mechanical pressure in a limited area of the nose, called by Mackenzie[1] the reflex area, can cause muscular asthenopia. By muscular asthenopia I mean impairment of the efficiency of the ocular muscles in the performance of their ordinary function.

The faulty pressure to which I refer is confined chiefly to the middle turbinate, but it may extend to the ethmoid cells, especially in cases of great hypertrophy of the middle turbinate. But I wish especially to point out that, without hypertrophy, where the middle turbinate is tightly compressed against the septum, or the septum is deflected against the middle turbinate, or a spur from the septum digs into the middle turbinate, or the middle turbinate is crowded by a deflected septum against the ethmoid cells, in all these instances we may have, and are almost certain to have sooner or later, muscular asthenopia.

As a corollary to this claim, I would say that all cases, wherein muscular asthenopia is present as a result of the conditions just now enumerated, are equally likely to give the history of nasal headache, hemicrania, or migraine. As the pressure is not absolutely certain to produce the muscular disturbance, so it is not absolutely certain to cause the headaches; but, in about the same ratio as the one form of disturbance is produced, will the other also be brought about. It is not a part of my thesis to demonstrate the corollary; but, as the corollary is of great value to me,

I wish to make use of it, and, fortunately for me, it has already been demonstrated.

Glasgow[2], Allen[3], Roe[4], Woolen[5], Pynchon[6], Loeb[7], Snow and others[24], who have investigated this offence of the middle turbinate, have made it evident by adequate inductive proof that the pressure and the headaches are correlates. They removed the pressure and, presto! the headaches disappeared—*sublata causa tollitur effectus.*

Patients suffering from such headaches seek the oculist in search of eye defects to account for them; they do not seek the rhinologist, because they have no symptoms pointing to a causative condition in the nose. It is in the study of just this class of cases that I have found the more or less constant presence of muscular asthenopia.

To prove my thesis one-half of the evidence is already in. I shall briefly summarize this before proceeding with other witnesses. The half that I refer to concerns the ciliary muscle; and as to this the following observers have reported, namely, Maxwell[8], Clark[9], Cheatham[10], Bettmann[11], Hamilton[12], Gradle[13], Wood[14], Berger[15], Ziem[16], and Nieden[17]. They have all found cases of asthenopia whose cause was some form of local irritation in the nose on removal of which the asthenopia disappeared. Coincidence is not proof, but it is evidence. The evidence is cumulative. It has its value in support of my thesis so far as the local cause had its location in the specified area—the irritable or reflex area of the nose.

There is other evidence of the same character that is still more available for my purpose, because it inculpates the external ocular muscles as well as the ciliary. It is furnished by De Schweinitz[18], Ziem[19], and Berger and Trymann[20].

In regard to the first group of witnesses, I will especially consider Maxwell's cases, some of whom were treated for nasal troubles as well as for asthenopia. It was noted that their asthenopia disappeared as soon as the nasal trouble was cured; and then the patients of their own accord threw aside their glasses without inconvenience. This would probably happen oftener in Maxwell's practice than it could in America. He very likely had to deal with but one kind of asthenopia, called by Gradle *normal* asthenopia, to distinguish it from another type which he called *excessive.* The former could tolerate without discomfort a small error of refraction. Seabrook[21], recognizing the same distinc-

tion, has employed for the second class of Gradle the well-chosen term *neurasthenopia.*

I purpose to avoid this second class and to present histories herewith of those alone that I regard as conforming to the normal type.

Cases II. and IV. are given in the *Medical News* for April 13, 1901. Cases V. to VIII. are as follows:

Case V.—E.——. E——, fifteen years old, schoolgirl; medium height, broad frame, plump, fat and heavy, well developed and well nourished. Rides a wheel. Appetite good. Menses regular; normal type. Yet she has frequent browaches, brought on by constant use of the eyes in study. Occipital headaches occasional, used to be more frequent. Some intolerance of light and excess of lacrimation on steady use of the eyes.

V. o. u. = $^{10}/_{10}$. Javal .50 c. a. 90°, with the rule

p. a. Ex. 4°. Ab. 26°, Ad 31°. p. p. of Acc., o. d. 12 cm., o. s. 11 cm.

p. r. Es. 3°, Ab 4½°, Ad 17°. p. p. of Conveg. 10 cm.

The left middle turbinate is tightly compressed against the septum. Instituted cold sponge baths every morning on rising. After two weeks at

p. a. Ex. 4°, Ab 10°, Ad 36°. p. p. of Acc. 10 cm.

p. r. Es. ½°, Ab 6°, Ad 18°. p. p. of Convg. 5 cm.

Divulsed the left middle turbinate vigorously and the right lightly and then tested again.

At p. a. Es. 6°, Ab 15°, Ad 29°, p. p. of Acc. o. d. 14 cm., o. s. 16 cm.

p. r. Es. ½°, Ab 6½°, Ad 13°. p. p. of Convg. 7 cm.

Two days later the patient reports having slept soundly without the usual restlessness and tossing. She has had no headaches since the divulsion, though she has used her eyes constantly; there is no photophobia, nor excess of lacrimation.

At p. a. Eq., Ab 14°, Ad 41°. p. p. of Acc., o. u., 10 cm.

p. r. Es. 2°, Ab 6°, Ad 18°. p. p. of Convg. 7 cm.

This case is given solely to show the effect on the muscles, first, of the faulty compression, second, of the mechanical disturbance, third, of rest for forty-eight hours after the latter.

Case VI.—G——. P——, well-developed schoolgirl of fifteen years; 5 ft. 6 inches in height, weighs 120 pounds. Good appetite. Good general health. Menses regular. Sleeps enough and is rested by it; nevertheless, for the last three years she has been restless and has tossed in her sleep a good deal. This has been

more marked during the last six months. She complains of blurring in reading, of twitching of the left eyelids and of headaches after prolonged study or writing.

V. o. u. = $^{9}/_{10}$. Javal o. d. 1.50 c. a. 90°, o. s. 1.00 c. a. 90°, with the rule. Exophoria $^{1}/_{2}$°, Ab $5^{1}/_{2}$°, Ad 15°. No hyperphoria. Acc. weak. Ordered + .50 c. a. 90°, o. u. to be worn till vacation. They were worn but vision was not clear with them, though better than without them.

Three and one-half months later, examined her eyes again under atropine. V. o. u. = $^{2}/_{10}$. Javal o. d. 1.50 c. a. 90°, o. s. 1.00 c. a. 90°. Found also H. o. u. 1.00 D.

Ordered, o. d. + .25 s ⌣ + 1.00 c. a. 90°.

o. s. + .25 s ⌣ + .50 c. a. 90°.

Three months later she reported relief of all the symptoms for which the glasses were given. Eleven months after her first visit she had a slight attack of grip. Six weeks later she came again with symptoms which she had had for more than a week. The left eye was heavy; the lid drooped; the left eye and brow ached; she felt as if she must keep that eye shut; both eyes were intolerant of light. Occipital pain occasionally. Tests with and without her correction both gave the same findings: Ex. $^{1}/_{2}$°, Ab 6°, Ad 19°. At p. a.: Ex. 18°.

The right middle turbinate touched the septum superiorly; the left was closely compressed against the septum throughout its entire surface. The patient has had a cough both this winter and last—a dry, hacking, ineffectual cough. The letters dance before her eyes in reading and her eyes are worse than they were a year ago when she first consulted me.

Two weeks later: She now complains of severe occipital pains. Cannot read longer than twenty minutes without troublesome dancing of the letters. Soon thereafter headaches set in.

In acc. at 10″, Ex. 18°, Ab 30°, Ad 30°.

At 20′, Ex. $^{1}/_{2}$°, Ab $6^{1}/_{2}$°, Ad 10°.

Owing to the narrowness and compressed character of the left naris, the left middle turbinate was removed as a whole.

Two days later: Her eyelids do not droop, although she continues to have pain over the left eye and in the occiput. But there is no blurring with her glasses, although the p. p. of Acc., o. d. is 25 cm., and o. s. 22 cm. Her p. p. of convg., however, is 5 cm.

In Acc., Ex. 18°, Ab 20°, Ad 28°.

At 20′, Eq., Ab $6^{1}/_{2}$°, Ad 16°.

Eleven days later. She accommodates for No. 1. J. at 12 cm. Ex. 6° to 20°, Ab 28°, Ad 23°.

At 20', Ex. ½°, Ab 7°, Ad 17°. Rel. Acc. Neg. 4 D. Pos. 2.5°.

No further headache, blurring, nor intolerance of light. Holds both eyes wide open. Sleeps better. Has no more backache, as she had before at times.

One month later: She now complains that although the eyes have felt all right, yet each night on going to bed she has a face-ache on the left side. I find a remnant of the turbinate left in, closely pressed against the septum, and remove it.

Two weeks later: Patient now reports that she has been free from the face-ache ever since last piece was removed. No other symptoms.

p. a. Ex. 6°-16°, Ab 30°, Ad 46°. p. p. of Acc. 10 cm., o. u.

p. r. Eq., Ab 8½°, Ad 35°. p. p. of Convg. 6 cm.

With the aid of the weighted convergence stimulus she carries 42° of adductive prisms to 20' and raises it to 65°.

The salient points in this case are these: The patient is a strong, healthy girl; has had restless sleep for three years; has symptoms of accommodative asthenopia and occipital headaches. There is exophoria; there is also weak abduction and weak convergence. She is given her correction for hyperopic astigmatism which she wears for nine months and then has the grip. Three months after that the left middle turbinate is removed and a month later a pressing remnant of the same. Since then all her symptoms are gone. She has now restful sleep. She reads continuously without discomfort. Her cough is gone. Accommodation and convergence are now good. The muscles all give strong tests and good balance except at the near point, where there is merely a lessened exophoria. The touching right turbinate is left severely alone, because there are no symptoms.

Case VII.—Miss M— C— D—, twenty-three years of age. In good health. Puts on flesh and mainstains good nutrition. She is wretched with very severe headaches, throbbing at times, which are becoming more severe and frequent. She has had them for many years. They extend from the right side of her forehead to the temple, vertex and occiput. Sleep often relieves them; but sometimes she canot sleep on account of them, they disturb her whole night and she rises with them the next morning. Her menses are regular, but painful. Her eyes burn. She has conjunctivitis. She has had styes. There is no special tenderness

of the trochlear or supra-orbital nerves. V = $^{10}/_{10}$ with each eye. There is the merest trace of vertical astigmatism. She has Hm.+.50s. Ophthalmoscope measures ×1.50s, o. u. She reads No. I. J. comfortably with or without +.75s.

At p. a. Ex. 9°. At 20′, Ex. 2°, Ab 4½°, Ad 12°.

Her left nostril is normal. Her right has a long shelf on the septum almost occluding the inferior meatus and the right middle turbinal is tightly compressed against the septum.

On February 21, 1901, this nostril was relieved of its ecchondrosis and its offending middle turbinal. The extent of surface disturbed caused tedious recovery. But, exactly one month later this patient reported that she had slept so soundly she had not heard the breakfast bell, a most unheard of occurrence with her. She has had no headaches. Menstruation occurred in the interim and was painless for the first time.

April 23, 1901. At p. a. Ex. 4°, Ab 23°, Ad 41°. At 20′, Es. ½°, Ab 5°, Ad 65°. p. p. of Acc. o. d. 9 cm., o. s. 8 cm. p. p. of convgce. 7 cm.

A new experience with her is to be able to shop all day long without a headache. She is an inveterate reader and has been reading many books during this last month without any discomfort. I have given her no glasses for her hyperopia; she does not seem to need them. If she were to have her correction, doubtless her eye-muscles would give even a better account of themselves. But, *cui bono?* She is perfectly comfortable as she is. This case has an argument in it for those who say that ametropia is the sole cause of asthenopia.

Case VIII.—Miss E—— M——, twenty-seven years of age. Stenographer. Woman of solid build and sturdy endurance. Likes work and does not tire at it. She has been wearing for two years, o. u. + .75 c. a. 90°, given her on account of pain in the eyes recurring daily.

Present symptoms: Headaches frequent for the last six months, occasionally very severe, extending along the right side of the head to the occiput. She has noticed blurring in her right eye, especially at the onset of her headaches, which are severe enough to drive her home from her work.

V. o. u. = $^{10}/_{10}$. Javal 1.00 @ 90°. Media clear. Fundus normal. In Acc. Ex. 8°, Ab 30°, Ad 20°, p. p. of Convgce. 12 cm.

At p. r. Ex. ½°, Ab 4½°, Ad 15°. No hyperphoria.

Right middle turbinate closely compressed against the septum; left middle turbinate touches the septum more lightly. Divulsed

both middle turbinates. After a month and a half with frequent tests in the interim, the following findings were obtained, associated with return of slight blurring in right eye, though headaches had been banished, together with an irresistible desire to close the eyes in church.

In Acc. Ex. 6°, Ab 25°, Ad 16°. p. p. of Acc. o. d. 13 cm., o. s. 10 cm.

At 20′ Es. ½°, Ab 6½°, Ad 31°. p. p. of Convgce. 12 cm.

I found the right middle turbinate still no better for the attempt at divulsion and felt compelled to remove it, as the blurring continued and the patient was unwilling to let the treatment go at that, if the condition could be bettered. This turbinate was removed after which there was some nausea and pain in the right eye for forty-eight hours. Blurring and photophobia to some extent continued in the right eye for ten days, after which her tests were as follows:

At p. a. Es. 2°, Ab 26°, Ad 31°. p. p. of Acc. o. u. 10 cm.

At p. r. Es. 7°, Ab 6°, Ad 8°.

Improvement kept up daily. Blurring went away. In two weeks,

At p. a. Ex. 5°, Ab 24°, Ad 25°. p. p. of Acc. o. d. 10 cm. o. s. 9 cm.

At p. r. Es. 1°, Ab 6°, Ad 34°. p. p. of Convgce. 11 cm.

Histories of cases belonging to the neurasthenic class also show improvement following proper attention to the same faulty condition. In these cases, however, I am loth to interfere radically; and I do so only upon the urgency of the patient's need of relief of most distressing symptoms, *i.e.*, when the asthenopia and headaches are both extreme.

When the removal of the whole of the middle turbinate is thought necessary, it is approached with great hesitation and circumspection. It is no light matter to deprive the nose of so important a functionary. Delevan[22] has pointed out a most scientific reason for its partial or complete removal. He found, by examination of the Hyett collection of skulls in the College of Physicians of Philadelphia, "in nearly every instance in which hypertrophy was observed it was confined to the middle turbinate bone of the wider naris." Operation for deflection would fail of its object without first removing a part, or the whole, of this hypertrophied body. After this, and not before, he would straighten the septum, and in this he is supported by Zuckerkandl[23]. I am able to add another reason to those which he has

given. I have found in such a case that the hypertrophied middle turbinate was the cause of a concomitant asthenopia which was sufficient of itself to call for its reduction or removal, before returning the septum to its normal place. But, where conservative surgery can save the body of the turbinate, it should be saved. Pynchon's guarded trephine is useful to this end.

In the study of these and of other cases not yet reported I believe I have grounds for making the following postulate: A moderate amount of pressure or mechanical irritation of the middle turbinate and adjacent septum will temporarily impair the function of the ciliary muscle. To a less, or more variable, extent it will also impair that of the external ocular muscles. I have repeated this observation many times when giving to patients that mechanical treatment necessary to relieve such pressure. Now, if mechanical irritation for a brief period can impair the function of these muscles, how much more would a continuous pressure irritation of that same area keep up that impairment! It is such continuous pressure that is produced by a spur, or bend in the septum when it digs into a too-closely-applied middle turbinate.

I do not look upon the headaches in these cases as in any way a symptom of the asthenopia: they are but frequent associates, yet, they are often inseparable. The reason for this must be evident. They have a common cause, pressure on the same sensori-motor branches of the fifth nerve. So far as the sensory part is affected a radiated or a reflex headache is produced; so far as the sympathetic fibers are affected a vasomotor reflex is produced. This is equally true where there are inflammatory conditions, as in ethmoiditis. It matters little whether the pressure is from *within* the ethmoid cells and turbinate, or is applied to these from *without*. The important point is that the same branches of these nerves are the nerve elements pressed upon and therefore the same kind of disturbances should be expected to follow.

Not *pain*, but *tire* is the expression of sustained and exhaustive effort by weak or inharmoniously acting muscles. If pain ensues, it is secondary and not the direct result of effort. The only part which vasomotor nerves can take in producing pain is to increase the blood-supply to a sensitive area and thus increase its susceptibility. The asthenopic disturbance is probably from the sympathetic fibers in this particular class of cases. That it is such in all cases is also probable. It could properly be inferred from other facts, as, *e. g.*, when treatment addressed to the uterus, the bladder, or the stomach in other cases, has given relief of the asthenopic

symptoms. The only thing conceivable as being common to all these varied causes is the element of the sympathetic nerves. In conclusion, I have only this to say by way of harmonizing the various facts, practices and theories, that I expect to see the time arrive when muscular asthenopia will be recognized as but a symptom of disturbance of a part of the sympathetic nervous system.

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PAPER:

A FEW REMARKS ON A GENERALLY UNRECOGNIZED EAR DISEASE (OTITIS MEDIA MUCOSA.)

HENRY A. ALDERTON, M.D.

During the winter 1900-01, because of the great prevalence of grippal and ordinary colds, the writer's attention was repeatedly drawn to the unusual frequency of exudative, non-perforative otitis media. The past year, in his experience, because of the increased virulence of the causative nasopharyngeal inflammations, the type has inclined more to the mucous than to the serous form of exudative inflamation. And, for this reason, its recognition has been attended at times with much greater difficulty. Unlike the serous exudative inflammation, *otitis media scrosa*, the mucous form appears to occur relatively more frequently in adults.

Folowing a severe cold, grippal or otherwise, the patient begins to have trouble with one or both ears. Possibly this may take the form of an evanescent earache, which yields quickly to the ordinary or extraordinary home remedies; in other cases no pain at all is noticed. Tenderness to touch of the parts around the auricle is more common and frequently recurs during the early part of the disease. In a day or so, whether there has been earache or not, hardness of hearing makes itself manifest, together with a feeling of stuffiness in the ear, as though the external canal were plugged, and a feeling of fullness, both in the ear and over one or both sides of the head, according as the affection involves one or both ears. Frequently there is present an intense tinnitus, which is either hissing or pulsating; often the tinnitus is likened to escaping steam. There is usually no sensation of throbbing, such as exists so often in an acute purulent otitis media. Because of the stuffiness and full feeling in the head, cerebration is difficult and concentration is a lost art. Autophony is usually noticed Cracking sounds on blowing the nose or swallowing are not so frequently observed as in the serous condition, probably because of the greater degree of tubal obstruction. The patient is unhappy, fearful for the future, and, because of his infirmity, unable to attend to his business. The hearing becomes so badly

involved that the watch is heard not at all or only close to the ear and conversation is indulged in only at the cost of considerable exertion on the part of the patient's family and friends.

If the exudation is formed rapidly and in considerable quantity, mild vertiginous attacks may occur. These atacks are not severe and mostly consist of a dizzy feeling, sometimes occurring on changing the bodily position. There are none of the other phenomena associated with Ménière's symptom-complex.

Because of the patient's anxiety for relief, he usually calls upon the aurist during the first week of the disease. On examination, after the removal of whatever detritus maceration and home remedies have evelved in the external ear canal, one finds that the osseous canal wall, unless irritated by overtreatment, has very little congestion and there is no swelling. There may be slight tenderness over the tragus or over the position of the Eustachian tube in the neck. The tympanic membrane is seemingly in about its usual position, neither retracted nor bulged to any appreciable extent. As a whole it may be pushed out a little more than normal toward the canal. The luster is gone, the surface has a dull gray, leaden appearance. Surounding this dull gray field is a ring of congestion and coursing across the field are a number of separate capillary twigs beginning at the periphery and disappearing towards the *umbo*. Along the hammer handle the malleal plexus is unusually pronounced. This hyperemia does not resemble, except remotely, that of a beginning purulent otitis media; it is dull and grayish red, not brilliant and distinct as in the latter affection. Schrapnell's membrane does not seem to be markedly affected. There is absolutely no fluid line discernible, nor can the presence of fluid be made out by any difference in the appearance of the various sections of the drum membrane.

Functionally, the ear is apparently very gravely involved. The watch is not heard or only on contact or very close to the ear. The whisper is heard for a very short distance, but the hearing for the spoken voice is relatively somewhat better. Bone conduction, for the Hartmann series of tuning-forks, is normal or better. The lower tone limit is impaired, even up to the C fork (128 d.v.s.), in certain cases. The upper tone limit is apparently very little, if at all affected. The intensity Rinné test shows as negative (that is, initial BC is heard better than initial AC), in marked cases as high up on the scale as the C^3 fork; rarely, the C^4 fork may give an equal reaction. The duration Rinné is likewise negative for the lower forks. In a unilateral affection, Weber's test is positive.

Examination of the nasopharyngeal cavities shows an active or retrogressing inflammatory process. The pulse and temperature are practically normal. Such a condition may endure, in various degrees, for from only a week or two up to a matter of years; in one of the writer's patients the condition had never entirely disappeared for about nine years. During exacerbations of the trouble the symptoms are as already detailed; with the subsidence of the congestive period the radiating vessels disappear, the drum membrane becomes uniformly a dull gray and remains thick and opaque, and the functional ability is slightly improved.

Change in the position of the patient's head does not induce the improvement in the hearing which is sometimes noticeable in cases of otitis media serosa. Inflation of the tympanum improves the hearing, though only temporarily, and never to the degree usually seen in the serous process. During the process of inflation mucous crackles can usually be heard with the otoscope.

Incision of the tympanic membrane alone sometimes gives exit to no secretion or to only a little teat-shaped projection, hardly visible through the hemorrhage from the cut edges. The drum membrane is often so thick and fibrous that considerable force is necessarily exerted in order to penetrate into the tympanum. But on forcible inflation the picture is changed. Then there appears in the canal a quantity of stringy, tenaceous mucus which follows the cotton on the applicator on its withdrawal from the canal as a long, filamentous string, for a distance of a number of inches from the external auditory orifice before it finally consents to part company. Often, in order to evacuate the drum cavity, it is necessary to inflate forcibly and repeatedly, assisting the extrusion of the mucus with the cotton applicator or with suction. After the removal of the exudate the hearing is immediately greatly improved and remains so until the incision heals and more mucus is formed.

Douching alone through the external canal has never seemed to do other than harm, in the writer's experience. Periodical inflation, combined with treatment of the nasopharyngeal condition, will in a certain proportion of cases bring about a slow recovery, but often the patient is not willing to await the results of so slow a process and gravitates from one to another practitioner, the true condition frequently being unrecognized, until permanent impairment of the function of the ear results from the inspissation of the exudate or the formation of adhesions or the deposition of

connective tissue in the mucous membrane of the tympanum by reason of the prolonged hyperemia.

Certain systemic remedies seem to be of benefit; such, for example, as the iodide of potash in increasing doses. But the treatment *par excellence* consists of incision and exacuation of the tympanum, repeated if necessary and always accompanied by regular politzerization and conscientious treatment of the naso-pharyngeal condition. The relief is immediate and, while subject to temporary setbacks, permanent for the current attack. Before incision the external auditory canal should be made as nearly aseptic as possible by syringing with a tincture of green-soap solution, folowing this with instillation of absolute alcohol and then by syringing with a 1-2000 bichloride solution. The canal is then packed with aseptic gauze and the patient sent back to the waiting-room for half an hour to await the subsidence of the increased hyperemia necessarily induced by these procedures. The patient is then subjected to a thorough cleansing of his naso-pharyngeal cavities. The gauze packing is removed and under good illumination a thorough incision is made with a sterilized knife along the inferior segment of the drum membrane just internal to its attachment to the *annulus*. The ear is inflated and the mucus removed by means of sterile cotton pledgets. Finally, the canal is again packed with aseptic gauze, covered outside by a cotton pad kept in place by adhesive plaster. A mild astringent application of a solution of silver nitrate or glycerite of tannic acid or the stronger glycerite of tannic and carbolic acids is applied to the postnasal mucous membrane.

The patient must be seen in from twelve to twenty-four hours and the ear again gently inflated and the gauze packing renewed. After this, a treatment once in every two or three days is all that is usually necessary. Often the drum membrane may have healed by the first dressing.

Should the exudate persist in reforming, a solution of nitrate of silver, ½ to 1 grain to the ounce of boiled distilled water, acts favorably, both injected into the Eustachian tube and instilled into the tympanum through the incision. The writer has never seen undue reaction follow this procedure, if the previous steps have been faithfully carried out.

142 Clinton Street.

PAPER:

TUBERCULOUS OTITIS MEDIA, MASTOIDITIS AND MENINGITIS IN AN OTHERWISE APPARENTLY HEALTHY ADULT. BRIEF REPORT OF A CASE.

JAMES FRANCIS MCCAW, M.D.

Tuberculosis, on account of the widespread interest which has been manifested for several years by the medical profession in the endeavor to check its ravages, the high mortality and the great importance of an early recognition, especially in those cases affecting the middle ear and its adnexa, make it of interest to us, not only as physicians, but as otologists. The case I have to report to this Society is of unusual interest, clearly exemplifying the error in diagnosis and treatment which is apt to be made in cases where mixed tuberculous and pyogenic infection is present.

In this case was it made especially difficult, from the fact that the patient was in deep stupor when seen, and my advice had to be given, based entirely upon the history and physical examination. On account of the findings and the apparent demand for immediate surgical interference, I doubt if I should have examined the secretions for bacilli had means been available, for nothing was found in the history or in my examination at that time which suggested to me the probability of a tuberculous process.

The following notes of the case, with the findings at the autopsy, will, I trust, be of interest:

W. H. W., male, adult, forty-five years of age, was seen by me in consultation on December 11, 1906, when the following history was obtained. His mother and father have always been healthy; are still living at an advanced age. There are two brothers and one sister, who are living and healthy. The patient suffered from measles when a child. At the age of twenty-five years had typhoid fever; since then has enjoyed perfect health, attending to his business, that of a mechanic, regularly. About one year ago, without apparent cause and only the slightest suspicion of pain, a thin discharge made its appearance in the left ear which was given little thought and allowed to take care of itself. From time to time after this, at intervals of one or two months, he suffered attacks of pain

in and around the ear, followed by an increased amount of discharge and relief from his symptoms. During these exacerbations there was sensitiveness to pressure and occasionally slight swelling about the ear, especially behind it. His family physician told me that up to the beginning of his last illness he had noticed little change in his physical condition. His present trouble began seven weeks prior to my seeing him, with what was supposed to be an attack of influenza: sore throat, nasal discharge, headache and temperature about 100° F. He was confined to his home for several days, after which he resumed work and was able to continue nearly two weeks, but during this time was not well, suffering from anorexia, occasional vomiting, persistent headache and general malaise. About this time he had one of his attacks of pain and sensitiveness around the left ear, which compelled him to remain in bed and the usual hot poultice was applied. In twenty-four hours there was an increased discharge of pus with complete relief of pain. Following this he gradually grew worse with exacerbations of pain and intervals of relief, loss of appetite, constant headache, an irregular temperature, gradual exhaustion, and for the last week remained in a drowsy condition, but from which he could be aroused and would answer questions; this changing to a deep stupor twelve hours before I saw him.

Examination.—Patient was emaciated, face of an ashy gray color, pupils equally contracted and no paralysis detected. He could not be aroused from his stupor, but responded to a stimulus. Pulse 58, temperature 102° F., respiration 36. A slight swelling was observed behind the left ear over the mastoid. Pressure over this area elicited pain; shown by the patient's attempt to remove my hand. There was a small amount of foul-smelling pus in the external auditory canal, the membrana tympani almost completely destroyed and only the head of the malleus remained. The tympanic cavity was filled with granulation tissue and pus, with perceptible bulging of the postero-superior canal wall. No glandular enlargements were observed.

It seemed clearly evident that this patient was suffering from an intracranial involvement following a chronic otorrhea, and it was thought that cerebral abscess was the most probable diagnosis. He was sent to the hospital, prepared, and the following operation done the same afternoon.

The middle ear was curetted and granulation tissue removed, flushed out and the canal packed with iodoform gauze. The mastoid was opened and found completely excavated, the space being

filled with granulation tissue and broken down caseating material. There was very little pus found and this was in the region of the antrum. The destruction of bone was widespread; the caries extending upward and forward into the root of the zygomatic process, forward to the middle ear; posteriorly into and between the tables of the occipital bone and inwardly destroying the wall of the sigmoid sinus and the inner table of the skull. All granulation tissue and carious bone was removed. This exposed the wall of the sigmoid sinus and meninges over an area about one inch by three-quarters of an inch. These were very much thickened and everywhere studded with small typical miliary tubercles. There were several caseating patches on the wall of the sinus which was, however, still pervious. At this juncture the hopelessness of the case being recognized, the wound was cleansed, packed with iodoform gauze and a large antiseptic dressing applied. The patient died twelve hours later. At the post-mortem examination the lungs, liver, spleen and kidneys were found free of tuberculous infection and the mesenteric glands not enlarged. Examination of the head was not allowed. Microscopical examination of scrapings from the middle ear and mastoid demonstrated the presence in abundance of tubercle bacilli and streptococci.

A very pertinent point, and one of the greatest importance in these cases, is that of etiology, for upon our correct estimate of the causal factor depends the ultimate result of treatment. In cases of mixed tuberculous and pyogenic infection in an otherwise apparently healthy adult, we are, I think, apt to be misled in the masking of the tuberculous by the suppurative process. Especially is this true if the patient is seen late in the disease.

The question which suggests itself to me in connection with this case as of greatest interest is, Was this a case of secondary tuberculous otitis media in which the primary focus was overlooked, or was it primary tuberculosis of the middle ear and mastoid with subsequent pyogenic infection?

In the light of recent investigation, tuberculous disease of the middle ear as a secondary involvement is not an infrequent occurrence. This view seems to have been accepted by most observers. On the other hand, the frequency of primary tuberculosis in this region is still in doubt. Milligan in a paper read before the Sixth International Otological Congress states: "In my experience primary tuberculous lesions of the middle ear and adjoining mastoid cells are comparatively common, especially among the children of the poorer classes." In a paper before the New York Medical As-

sociation in 1898. Oppenheimer takes the opposite view and says, "The primary form is rarely observed, and then, from the extreme difficulty of eliminating the presence of tuberculous deposits in other portions of the economy, it becomes a matter of hesitancy to decide as to the diagnosis being essentially accurate." While we hesitate to accept either of these views as representing the weight of opinion, the evidence which we have been able to gain in reviewing the literature at our command, together with our clinical experience, does not bear out the views of Milligan, that primary tuberculosis of the middle ear is of comparatively common occurrence.

The observation and clinical experience of most observers go to show that it is comparatively infrequent, but does occur. Recognizing the difficulties in arriving at a correct diagnosis in this class of cases, it would seem that in the light of the clinical history, the findings at the time of operation, the microscopical findings and the subsequent post-mortem examination, we had here to deal with a case of primary tuberculosis of the middle ear and mastoid. My only excuse for operating was an error in diagnosis, for the case was beyond help.

In conclusion, I will add that could we get these cases early, before too much destruction of tissue has taken place, they would seem to offer some hope of improvement from radical surgical interference, with subsequent supporting treatment and proper climatic environment.

DISCUSSION.

Dr. Goldstein, of St. Louis, reported three cases observed by him during the past ten years of mastoiditis which might possibly be considered primary. The first case had been reported about nine years ago. The patient was a little colored boy in whom the sequestrum contained the cochlea and part of the semi-circular canals. Numerous tubercle bacilli were found in the discharge from the ear, and physical examination failed to reveal a tuberculous process in other parts of the body. Eight months later this child died of pulmonary tuberculosis, so that it could not be said that the case was really one of primary tuberculosis of the ear. The second case was that of a girl of nine years, whom he had operated upon about seven years ago. The granluation tissue had been found already invaded by tubercle bacilli. The child made an uneventful recovery, and was still living. The third case had been operated upon twice for mastoiditis, the second operation having been about six months ago. The wound was now slowly healing, and he was inclined to think there was still a tubercular

focus or nidus in the ear. Examination of the sputum and of the lungs had been negative as regards any other tuberculous process. These cases were possibly examples of primary tuberculosis of the ear.

Dr. J. F. McKernon, of New York, said that three years and a half ago he had had a case under observation for a short time before operation. After operation the wound had failed to heal, and after about four months examination of the granulation tissue had shown the presence of numerous tubercle bacilli. The lungs had been carefully examined by two excellent diagnosticians, but no tuberculosis discovered. He had had the case under observation ever since the operation. The wound of the ear would heal at intervals, and then break down again. No evidence of general tuberculosis had yet been discovered, and he was inclined to look upon this as a case of primary tuberculosis of the middle ear. Packing the ear with gauze soaked in the valeriante of guaiacol seemed to be the only thing that provoked even temporary healing.

PAPER:

SCHWARTZE-STACKE OPERATION FOR CHRONIC SUPPURATIVE OTITIS MEDIA; REFORMATION OF THE TYMPANIC MEMBRANE; SECONDARY MYRINGECTOMY; IMPROVED HEARING.

M. D. LEDERMAN, M.D.

Chronic purulent disease of the middle ear is an insidious affection, in which clinical symptoms do not always correspond to existing pathological changes. It is not unusual to find patients presenting seemingly serious symptoms, in whom but a small quantity of granulation tissue is discovered on opening the mastoid. Then again, the opposite state of affairs may exist, for we all, no doubt, have met with cases where the subjective symptoms did not lead us to suspect the presence of such advanced disease as the operation revealed.

Cholesteatoma and necrotic sequestra have been removed from the mastoid and middle ear in cases where pathognomonic symptoms were absent. A patient illustrating the preceding statement, was operated upon in private practise, for an excessive purulent discharge from the right ear. He was fifty-two years of age, of large stature and florid complexion. The disease of the ear had

existed for six weeks, in spite of regular local treatment, so he consented to the mastoid operation, in the hope of being relieved.

A fistula was formed in the posterior wall of the canal, from which there was a free discharge of sweet-smelling pus. No classical symptoms of mastoid involvment were present.

On opening the mastoid, I was surprised to find such extensive disease, with so little constitutional disturbance. The mastoid process was a mere shell, filled with pus and granulation tissue. Two loose sequestra of necrosed bone were removed with the forceps from the cavity. One of these was as large as a hickory-nut, while the other was about half the size.

The external wall of the lateral sinus was diseased, though the vessel itself was not affected. After a thorough application of the spoon curette, free drainage was established through the middle ear. The fistula in the posterior wall of the canal led into the anterior mastoid cells. The mastoid process was broad and deep, and the disease had progressed so rapidly that the resulting excavation readily admitted the introduction of four finger tips. The probe showed a depth of nearly two inches.

On the third day after the dressing had been removed, the probe was passed along the upper and anterior surface of the cavity, when suddenly the patient had a severe attack of vertigo in bed. This symptom demonstrated to my satisfaction that the semi-circular canals were in the immediate vicinity. The attack lasted but a few moments, and was the first of the kind that had shown itself up to that time. Later, however, he had slight attacks of dizziness, when the head was suddenly moved upwards. Some further exfoliation of osseous tissue was noticed during the healing of the wound, but a good result followed, with complete cessation of the aural discharge and fair hearing power. The purulent secretion stopped promptly after the mastoid was opened. Have seen the patient recently, and he has had no unpleasantness since the operation, which occurred two years ago.

The above history was cited, as it strikingly emphasizes the rapid progress of an infectious process, after the subsidence of acute symptoms. We must not overlook the fact that necrosis of the osseous structure in the mastoid may be active, even though the middle ear disease has assumed a quiescent state. In such cases it is not easy to form an opinion as to the actual state of affairs, and, consequently, no definite line can be drawn as to the proper time for radical intervention. Each case must be judged from its clinical aspect, and when careful local measures have

failed to permanently stop the suppurative process, more heroic methods should be employed.

Bacteriological examination of the discharge will lend its weight in arriving at a conclusion, if other symptoms are not indicative. The presence of streptococci or pneumococci in the secretion certainly favors surgical treatment.

The history of the patient upon whom this paper is based herewith follows:

Mrs. X., aged twenty-four, was referred to me by Dr. H. Stark, for an opinion as to the prognosis of her local trouble. The right ear began to suppurate at the age of eleven, following a blow on that side of the head. This symptom continued on and off, in spite of local treatment by different aurists, up to the time she came under my observation. Granulation tissue had been removed at various times, with some improvement, but the discharge would soon return, bloody in character and very offensive. According to the patient's statement, no mastoid symptoms were experienced at any time.

For eight years, however, she has suffered from headaches over the right side. During the last four years the purulent discharge from the ear has been almost constant, though local treatment has been regularly carried on. The headaches still persisted, causing insomnia.

At my first examination, on October 23, 1900, some foul smelling secretion was found in the right canal and middle ear. The membrana vibrans and the malleus handle had been absorbed. The probe revealed caries of the remaining portion of the malleus and incus, together with disease of the attic. A small quantity of pus was removed on the cotton tipped applicator from the posterosuperior region of the middle chamber. Some tenderness on deep pressure over the mastoid antrum was detected. There was little pain in the ear, but the most disagreeable and distressing symptom was a constant, agonizing headache which caused insomnia.

Four days previous to my examination she had had two distinct chills, though no elevation of temperature was found during the examination. No other symptoms were present. Advised radical operation without further delay.

On October 31, 1900, the mastoid was opened, according to the usual Schwartze technique. The membranous canal was pushed away from the posterior wall of the meatus, and held by a strip of gauze. An opening was then made through the eburnated

cortical surface of the mastoid, and the antrum was found situated at a considerable depth. The lateral sinus lay very superficially, and to make matters more difficult, the dura dipped very low. It required delicate maneuvering to avoid wounding these structures, as the antrum lay between them; the sinus acting as a posterior boundary, while the dura was the upper wall. No pus was found in the antrum, but some granulation tissue was removed with a small spoon. With the aid of an angular rongeur forceps, the posterior wall of the canal was taken away, being guided by a probe in the antrum and additus.

The necrosed malleus and incus were readily extracted through the enlarged opening, and the additus and attic were thoroughly curetted. No disease was detected elsewhere. An incision was made on a horizontal plane through the membranous canal, and the divided tissue was adjusted to the bone wound and held in position by a soft rubber drainage tube, inserted in the meatus. On account of the very offensive discharge which had existed, it was deemed judicious not to close the whole of the posterior wound. The upper and lower portions were sutured, and a thin strip of gauze, soaked in a fifty per cent. enzymol solution, was placed in the posterior opening.

For five days after the operation the offensive odor persisted, though no pus was seen in the mastoid wound. On the sixth day the stitches were removed and union had taken place. Very little discharge was seen in the canal, but the odor was still present. The severe headache, however, had disappeared entirely.

The enzymol dressings were kept up for two weeks, and at the end of that time the odor could no longer be perceived. Nosophen gauze was then substituted and continued until the final closure of the wound, which took place in six weeks from the date of operation, with complete cessation of the discharge.

During the latter part of January, 1901, Mrs. X. noticed some tenderness over the mastoid. On examination, a secondary membrane was found in the usual position of the normal drum, but no signs of active disease could be discovered. The patient's pulse and temperature were normal, so anti-neuralgic medication was prescribed. This symptom of tenderness persisted for two weeks. Thinking that some secretion was pent up in the middle sear, the secondary membrane was removed. No fluid or pus was found, but a small quantity of granulation tissue was curetted from the posterior portion of the attic. My manipulations in this region induced a severe attack of vertigo, complicated with repeated at-

tacks of projectile vomiting whenever the patient assumed an upright position. This unpleasant reaction occurred in the office, and the vomiting lasted for two hours. The labyrinthine fluid had evidently been disturbed. After resting in a recumbent position for the time mentioned, Mrs. X. was able to go home in a carriage. The dizziness continued for two days. Dry dressings of nosophen was the after-treatment employed.

The mastoid tenderness disappeared in two days, and up to the present has not returned. At one time the advisability of again opening the mastoid was strongly considered, but the patient agreed to abide by the result of the myringectomy. Fortunately, this procedure relieved the disturbing symptoms.

The cosmetic result of the radical operation was beyond expectation. No external deformity can be noticed. On examining the canal, the inner and posterior portion appears quite dilated, but it is all covered with skin. Another membrane has partially reformed with a central opening. No moisture has been seen since the last curettement. At the time of her first visit, my record shows that she heard the watch two inches; whispered voice two feet. During the last test, on May 21, 1901 the watch could be heard at 45 inches; whispered voice 12 feet.

From these two cases, it is interesting to note the different degrees of local resistance. It is not unusual to find patients who have had repeated attacks of suppurative otitis, without extension of the infection to the neighboring cells. This type of the disease may be cured through the external auditory canal in a number of instances.

We must not forget, however, as cautioned by Macewen, that cases of intracranial pyogenic extension have occurred, as the result of removing aural polypi which were protruding into the middle ear. These granulation masses project through the bone from the dura mater, which they serve to protect, so long as they remain intact. In removing them, a fresh surface with open mouths of vessels is exposed, and absorption through the softened brain membrane is apt to occur. The granulations afford a definite protection from the invasion of certain pyogenic organisms as long as they are left in position. This tissue may secrete, but it does not readily absorb, as it is not supplied with lymphatics. In removing these growths, we must take precautions that absorption through the wounded area will not occur.

The combination of objective and subjective symptoms may lead us to advise the radical operation in cases of purulent disease

of the middle ear, which have resisted careful and regular local treatment. Suppuration of the mastoid itself can only be cured by opening the cells, as the disease in this region shows a tendency to progress, though the extension may not be rapid.

If the affection is united to the mastoid antrum, it may heal spontaneously, according to Jansen. This is more apt to occur if the antrum is small and situated high. If the position of the antrum is low, and it is of large capacity, the disease can only be cured by opening the mastoid.

The character of the discharge will assist us at times to determine the condition of the parts involved. A constant mucoid secretion coming from above, without subjective symptoms, suggests disease limited to the antrum, with an unobstructed passage. Such a case may get well without radical treatment. Where the discharge is irregular and quite offensive, it points to disease of the mastoid process, and operative intervention is indicated. Marked caries of the attic and tympanic walls, with excessive granulation tissue, which tends to recur after removal through the canal, demands more heroic surgery. Prolonged conservatism will at times be forced to the decisive step, by an acute exacerbation of a chronic suppurative process.

PAPER:

CLINICAL NOTES ON ADRENALIN.

NORTON L. WILSON, M.D.

During the summer of 1900 Dr. Jokichi Takamine informed me that he was endeavoring to separate the alkaloid or active principle of the suprarenal gland. In October of that year I called at his laboratory and saw what the doctor designated the blood-pressure raising principle of this gland. He submitted to me, for inspection, a grayish-white powder, which, under the microscope, showed needle-shaped crystals.

It was sparingly soluble in water, but dissolved readily in dilute acid. A solution of one to ten thousand parts in water was made and dropped into the doctor's eye. He assured me that he had himself introduced it into his own optic on several occasions without injury. In its basic form it absorbed oxygen from the air so rapidly that it was necessary to make a salt of it, and for this purpose hydrochloric acid was added, and as a result thereof there was obtained a chloride.

The active principle thus isolated had not then been named. Upon the suggestion of the writer the name "adrenalin" was given to the newly-discovered product, and under this name it is placed upon the market by its manufacturers, Parke, Davis & Co.

Three solutions were made: one of one part to ten thousand; one of one part to five thousand and one of one part to one thousand. At present the only solution manufactured is that of one of one part to one thousand. To these solutions of adrenalin chloride the manufacturers have added one-half of one per cent. of chloretone, for which they claim a slight anesthetic and antiseptic action.

It is also manufactured in tablet form with sodium chloride, and in this form tartaric acid is used instead of hydrochloric acid, making it a tartrate of adrenalin. The tablets are very soluble in water, and when added to one drachm of water make a solution one to one thousand. In this form they are most convenient for use. In the form of solutions contaminations soon follow, especially if a dropper is frequently introduced. Sterilization can be effected by boiling without apparent injury to the solutions, but

the tablets are more desirable because they can be used from time to time as occasion requires for making fresh solutions in small quantities.

It is unnecessary to furnish you with a tabulated statement of the number of cases in which the writer has used adrenalin.

It has been used freely by him in cases affecting the eye, the nose, the throat and the ear. For the eye he has used the solutions of one part to ten thousand and of one part to five thousand only, reserving that of one part to one thousand for the nose, throat and ear.

His experience shows that one drop instilled into the eye produces a slight smarting sensation for about twenty seconds, during which time there is a noticeable hyperemia of the conjunctiva. This soon disappears and the blood is rapidly driven out of the vessels. In forty seconds the entire conjunctiva is blanched almost white. This anemia is not only present in the ocular conjunctiva, but also in the palpebral. This marked contraction of the blood vessels lasts about one hour, after which time the vessels gradually resume their normal appearance. The use of these solutions has shown no appreciable effect upon the cornea or pupil. No drying of the epithelium of the cornea, like that produced by cocaine, or dilatation of the pupil has been observed, and no anesthetic properties have manifested themselves. So far as could be noticed the sympathetic nerve was not stimulated and the palpebral fissure remained unchanged, while the tension of the eyeball was neither increased or diminished. As a result of its use cocaine or holocaine anesthesia is much deeper than it otherwise would be. This was first noticed in making iridectomies. This is due, it is believed, to the depletion of the vessels and the opportunity offered the anesthetic to penetrate the tissues.

In acute plastic iritis a more rapid and decided effect will be obtained from the use of atropin by the application of a few drops of adrenalin.

The writer has used it with success in the removal of pterygium, lipoma, chalazion, squint operations, foreign bodies under the conjunctiva, and especially in the dilatation of the lachrymal duct. In acute contagious or chronic catarrhal conjunctivitis he has found it to be of little or no permanent benefit.

Your attention is especially called to its application to the nose and throat. If applied to the interior of the nose it blanches the membrane almost immediately. In the examination of the nasopharynx it will be found to be of great assistance because it con-

tracts the tissue of the turbinates so thoroughly as to enable one to look through the nostrils into the naso-pharynx. In profuse bleeding it is of little use, as it is rapidly washed away, unless a soaked pledget of cotton is packed into the nostril. After a few minutes the cotton may be removed and the hemorrhage will have ceased, especially those annoying hemorrhages from the septum.

In acute coryza it will relieve the swelling of the turbinates almost immediately and stop the profuse watery discharge. For temporary relief in hay fever it has no equal and is less apt to produce irritation than the solutions of the suprarenal gland.

In a case of acute laryngitis, coming under our observation, where there was a loss of voice and considerable pain during the act of deglutition, the voice was restored in twenty-four hours and the pain very materially lessened with five applications of the spray.

In acute pharyngitis and tonsilitis the relief is immediate and more lasting if its use is combined with that of cocaine or eucaine.

Every operation within the nasal chambers can be made bloodless, or nearly so, by the use of adrenalin, but it must not be forgotten that within an hour thereafter there will follow some bleeding. The bleeding will be no more than it would have been during the operation if adrenalin had not been used. If you desire to control the hemorrhage you must give the patient a solution (one part in five thousand) to be used at home for two days.

In la grippe and other acute inflammations of the nasal mucosa, where the outlets to the accessory sinuses are occluded, it is valuable in relieving the swollen mucosa and thus draining the sinus. In operations affecting the ear, the writer's experience with adrenalin has been limited to the removal of polypi and granulation tissue, except in those cases where he has passed a few drops into the Eustachian tubes for the purpose of facilitating the introduction of a bougie.

Adrenalin is best used in combination with cocaine or holocaine by first applying the former, followed immediately by the cocaine. I have never seen a case of cocaine toxemia when used with adrenalin.

It can be boiled and thus made sterile. It does not interfere with any other treatment which may be desirable as supplementary. Its use keeps the field of operation free from blood.

It is more certain in its physiological action because you can graduate the dose.

It is clean, being free from foreign matter, and thus the preparation is more stable and less likely to decompose.

I do not use it in powder form, as it causes sneezing and is much more irritating than the solution.

So far as has been observed no harm has come from its liberal use, and the writer believes that it is a most valuable addition to our pharmacopeia.

In conclusion, I ask your indulgence while I briefly describe two cases where adrenalin was administered internally with good effect. Incidentally it may be said that the best way in which to secure good results is by absorption from the mucous membrane of the nose or mouth and not by the stomach.

The first case to which your attention is called was one of scurvy with profuse hemorrhage from the nose which had been previously packed and which had continuously oozed during the twenty-four hours preceding the time when the patient was seen by the writer.

Ten drops of the solution of one part to five thousand was put into his mouth every hour until thirty drops had been absorbed when the hemorrhage ceased and the packing was removed.

The second case was that of a pregnant woman having a profuse hemorrhage from the nasal septum of the right side. This was controlled with a Simpson's compressed cotton tampon. At the end of a week the hemorrhage occurred in the left nostril, the control of which was attempted in the same manner, but there was a continual ooze, and the patient was very weak from the loss of blood. She complained so bitterly of the pressure of the tampon that resort was had to ten drops of the solution of one part to one thousand. This was put into her nose four times a day. The hemorrhage promptly ceased, the tampon was removed, and fearing a return of the bleeding adrenalin was dropped into the nostril for several days.

There have been no more hemorrhages.

DISCUSSION.

Dr. J. A. Stucky, of Lexington, Ky., said that he had used adrenalin extensively in nose and throat work since last November. He had found that it did produce some anesthesia. When used with cocaine less of the latter was required, and the anesthesia lasted longer. He had found it particularly valuable in middle ear operations. He did not believe there was any more hemorrhage after its use than operations in which it was not used, except perhaps where there was a great deal of spongy tissue. He

rarely used a solution stronger than one to three or five thousand; in subacute laryngitis he employed a solution of the strength of 1 to 10,000. An especially useful combination was with resorcin. He had also found it a very valuable remedy to combat the shock following anesthesia from chloroform or ether. In one case of this kind, occurring after chloroform, he had poured about half a drachm of a 1 to 5,000 solution on the tongue, and very quickly the heart action had been revived.

Dr. T. Passmore Berens, of New York City, said that he had been using adrenalin for about six months and had found that it kept well in his office. He had purposely left one vial uncorked for six weeks, and had found it perfectly sweet and effective at the end of that time. It would blanch and clear up the Eustachian tube in those cases of acute middle ear catarrh of tubal origin. It had been his practice to inject through the catheter into the tube from three to five drops of the 1 to 1,000 solution, and then with a Politzer bag to blow it into the Eustachian tube. This would keep the tube open for a sufficient length of time to give the patient a great deal of comfort by allowing drainage through the tube. He had also used it hypodermically in two cutaneous operations about the face, and with good result, and also injected it beneath the mucous membrane of the cheek in opening the antrum of Highmore. Here it had answered well in preventing hemorrhage.

Dr. M. D. Lederman, of New York City, thought the drug was especially valuable in lessening the absorption of cocaine, and hence preventing the occurrence of cocaine toxemia. Such cases were not nearly so frequent since adrenalin had been in general use. In a case of nasal hydrorrhea the local effect of the remedy had been shown when given by the stomach in conjunction with the local treatment. As it was an animal extract, he favored combining it with some cardiac stimulant to guard against the occurrence of cardiac weakness, when given internally, though it increases blood pressure.

Dr. Otto Stein, of Chicago, said that he had recently used this remedy in a case of antrum disease, expecting to have a bloodless field, yet he had had about as much hemorrhage with a 1 to 1,000 solution as if he had not used it. He employed it in another case in which he had entered the maxillary sinus, and the hemorrhage had been just as profuse as if it had not been used. He had commonly employed adrenalin in the strength of 1 to 3,000, though sometimes in stronger solution, and he had kept it in contact with the tissues for ten or fifteen minutes.

Dr. Talbot R. Chambers, of Jersey City, N. J., said that he had done the Gleason operation on the nasal septum a good many times, and had not observed the loss of over five or ten drops of blood from cutting the septum if adrenalin had been used. His method was to inject a few drops of adrenalin (1 to 1,000 with 5 per cent. solution of cocaine), underneath the mucosa, and then the syringe was withdrawn and a few more drops injected.

Finally, a few drops was injected under the mucosa near the anterior nares. Just before operating, some cotton with 20 per cent. cocaine is wiped over the hollow of the septum. There was no bleeding after cutting the septum under these circumstances. In one case in which he had done a secondary mastoid operation for purulent otitis media, a cholesteatoma had been found. It would have been almost impossible to have enucleated this entire without the use of the adrenalin, yet with the latter this operation had been performed with perfect success.

Dr. H. Holbrook Curtis, of New York City, said that while he thought the discovery by Dr. W. H. Bates of the superarenal extract ranked with that by Dr. Carl Koller of cocaine, he had come to the conclusion that there were cases in which because of idiosyncrasy it acted very badly. He had had eight or ten cases in which there had been an absolute intolerance of adrenalin and of any of the preparations of the suprarenal gland. In one of the first of these cases a gentleman sneezed for two hours and a half after having used the suprarenal extract, and then on his return cocaine had been used and had given immediate relief. The sneezing had, however, returned in the evening, and had lasted for hours. He had had hay fever patients after using suprarenal extract for a few days, suffer from violent pain in the upper part of the nose, necessitating the discontinuance of the remedy. Last fall he had himself used adrenalin spray for a few days, and then a terrible coryza had set in and had resulted in a genuine hay fever, which had only ceased on the discontinuance of the adrenalin. He had done over 100 septum operations, and when used with cocaine he had yet to see any untoward symptoms. He would like to know if intense pain or sneezing or violent coryza had been noted by others after the use of this substance.

Dr. Edward B. Dench, of New York City, said that he had not used the adrenalin, but had employed suprarenal extract. In all of his cases the effect had been entirely satisfactory as far as the control of hemorrhage was concerned. In one case, where owing to the age of the patient he had avoided general anesthesia, he had done an Asch operation with the aid of cocaine and suprarenal extract, and there had been practically no loss of blood. This has been his experience in many other cases. In middle ear work he had found suprarenal extract of great value. His method of using it was to saturate a small strip of gauze with the sterilized solution of suprarenal extract, and pack this through the speculum down upon the bleeding point. If left there for about a minute and a half it would be found that the field was practically dry.

Dr. S. MacCuen Smith, of Philadelphia, said that he had found the drug of special value in cases in which it was used with cocaine to prevent cocaine poisoning. He was accustomed to apply a 20 per cent. solution of cocaine, but he never sprayed it into the nostril, but simply made a local application of this solution. Up to the present time he had no trouble with cocaine alone.

Dr. WALTER B. JOHNSON, of Paterson, said that it was important that the field be made thoroughly clean before the application of the adrenalin. He could not see that there was any difference in the action of suprarenal extract and adrenalin, though on the score of convenience adrenalin was greatly to be preferred. He had not met with any idiosyncrasies, all of the cases in which he had used it having been very satisfactory. The effect of the adrenalin on the lymph channels of the eye was very important.

Dr. MAX A. GOLDSTEIN, of St. Louis, said that occasionally a very acute irritation was produced by spraying a weak solution of drug on the mucosa. He would like to suggest to Dr. Takamine that this might be overcome by dissolving the adrenalin in an oil instead of using an aqueous vehicle. A 1 to 1,000 solution would be found useful in cases of acute congestion of the larynx, the acute laryngitis of singers. If a solution of this strength were sprayed upon the larynx just before singing the result would be most gratifying.

Dr. L. L. MIAL, of New York City, said that he had used the suprarenal extract in the nose in two cases in which it had produced violent sneezing, lasting ten or twelve hours. The solution of adrenalin with chloretone was distinctly anesthetic, and did not produce this sneezing. He had used this combination in removing spurs from the septum and chalazion from the eyelids. It caused slight smarting for a few seconds, but was very soothing after the application of sulphate of copper in cases of trachoma.

Dr. M. R. WARD, of Pittsburg, said that he had had some adverse results, but had not attributed them to the drug used but rather to a defective technique. He had met with some irritating effects from the remedy, but had never seen any hemorrhage after its use. In some plastic operations on the septum he had had some difficulty in the way of sloughing. Whether this was due to lack of cleanliness or to the disturbance of nutrition produced by the drug he was unable to say.

Dr. R. C. MYLES, of New York City, said that he had been particularly fortunate in the use of powdered suprarenal extract during the past few years. In the last few months he had unfortunate results with the aqueous solution with resorcin, and had three patients leave him because of this. In one case he had used in the nose a 10 per cent. aqueous solution of suprarenal extract containing 2 per cent. of resorcin. It had caused very troublesome sneezing, and then the patient had disappeared. In another case the sneezing had lasted all night and all the next day. All these unfavorable results had occurred in connection with the use of the aqueous solution of suprarenal extract, never with the powdered extract. The solution had been boiled each time.

Dr. PRICE BROWN said that he had not used the extract for about one year because he had met so frequently with irritation. He intended to try adrenalin.

Dr. CHARLES W. RICHARDSON, of Washington, D. C., thought that all must have noticed certain constitutional effects, such as

attacks of vertigo, with nausea and headache, resulting from internal administration of the drug.

Dr. JOCHICHI TAKAMINE, of New York City, was invited to take part in the discussion. He said that his work had consisted simply in the isolation of the active principle of the suprarenal gland. He had been the first one to isolate this active principle in the chemically pure crystalline form, and he looked upon this feat as only the beginning of great progress in organotherapy. It was probable that the active principle of many other glands would be similarly isolated in the near future. The very fact of adrenalin being crystalline was Nature's certificate that it was a definite chemical substance. It was not his province to determine the best dose or strength in which it should be used. Chemically, the adrenalin was a very mild alkali, the alkalinity of which had been just neutralized. He could not, therefore, understand why it should produce such irritation as had been described by some of the speakers. Dr. E. Fletcher Ingals, of Chicago, was one of those who had complained to him of the irritation produced by adrenalin, but from a published article by Dr. Ingals he had learned that this physician had been in the habit of dipping his instruments into a formalin solution. This, of course, would readily explain the irritation observed. It was well known that distilled water produces a good deal of irritation in the eye, and also in the nose, and hence, the solution should be made slightly alkaline. The ordinary suprarenal extract contained considerable mineral matter, and its solution was therefore similar to normal salt solution. He had tried the plan of dissolving adrenalin in oil, but had found it practically insoluble. He had, however, succeeded in making an oleate of adrenalin, but the moment this is sprayed it is liable to oxidize and to become quickly inert. It might be possible by the use of a device which would expose only five or ten drops to the air to make use of this oleate and so overcome the objection just mentioned.

Dr. WILSON, in closing the discussion, said that he had observed none of the cases of irritation. He had seen irritation from the watery extract of the suprarenal extract, and yet in the same patient adrenalin had not produced this irritation. He had never succeeded in obtaining as active a preparation of the suprarenal extract after sterilizing it by heat. Such deterioration he had not observed with adrenalin, which could be sterilized repeatedly without lessening its efficiency. He had never observed sloughs after the use of adrenalin, though he had used this drug for two days after operation. He was inclined to think that some physicians used it too strong; one to five or ten thousand was strong enough for ordinary cases.

SYMPOSIUM ON DISEASES OF THE FAUCIAL TONSIL AND PERITONSILLAR TISSUE.

ANATOMY AND PHYSIOLOGY.

NORVAL H. PIERCE, M.D.

Abstract.—Dr. Pierce said that lymphoid tissue is plentifully distributed throughout the body. It is abundant in the larynx, especially about the ventricles. It is absent from the trachea. This tissue is widely distributed through the animal kingdom, being present in the mammalia with the exception of the rodents. At birth the tonsil consists of a sac; it could rarely be recognized as the tonsil at this time. The supports, and consequently the shape, of the tonsil vary in individual cases. The supratonsillar space is triangular, its apex projecting up between the palatal muscles. In this space, so-called tonsillar abscesses occur. This space should always be explored in examining the pharynx. Little is known of the function of the tonsil, though recent experiments seem to indicate that it has the same office as the ductless glands in the body.

PAPER:

ACUTE SUPPURATION OF THE FAUCIAL TONSIL AND PERITONSILLAR TISSUE.

M. A. GOLDSTEIN, M.D.

It is an unusual fact, and one worthy of special consideration, that while the etiology and focus of infection in acute suppurative processes of superficially located tissues and organs are fairly well known, that of the peritonsillar tissue is still shrouded in obscurity.

The faucial tonsil has now come to be regarded as a most formidable point of entrance of pathologic micro-organisms, and in this role a recent author writes of it: "There are five main avenues of infection of the system. 1. The Respiratory Tract. 2. The Alimentary Canal. 3. The Genito-Urinary System. 4. The Skin. 5. The Faucial Tonsil.

It is well established that the opportunity for infection and the development of acute suppuration of the tonsillar and peritonsillar tissue is unusually favorable, yet a suppurative process limited to the tonsil per se is very rare. Infection of the tonsillar

crypts, superficial ulceration, membranous or caseous deposits in the follicles or over the surface of the tonsil, are very common conditions, but acute suppuration limited to the tonsil, going on to abscess formation is an extremely rare condition.

It is the peritonsillar tissue which seems to be the locus minus resistentia; for whenever an infection of the tonsillar area is followed by abscess formation, it is here that the suppurative process is concentrated.

At first glance it would appear easy to trace the etiology of an infection of the supratonsillar fossa, but when the clinical factors are gathered and the anatomical relationship of the parts carefully considered, we meet with numerous difficulties in arriving at a definite conclusion. It is a frequent clinical observation that peritonsillar inflammation and suppuration may occur without any apparent inflammation of the tonsil. In fact, I have frequently seen intense abscess formations in this area where the tonsil was small and apparently healthy.

On the other hand, the faucial tonsil may be involved in an intense acute inflammatory process and the inflammation may be absolutely limited to this area. I would add to these conclusions another observation, that we may have an acute inflammatory process superimposed upon a long-standing pathological condition of the faucial tonsil and often under these circumstances with a much lessened power of resistance of the accompanying glandular tissue, no peritonsillar infiltration takes place. Or, we may have a peritonsillar abscess conjointly existing with a hypertrophied tonsil with gaping crypts and a parenchyma whose power of resistence is far below par, and still the tonsil itself may not be involved in the suppurative process. If, then, a close relationship exists between the tonsillar and peritonsillar structure, why should there not be a more ready diffusion or infection of a suppurative process from the tonsillar to the peritonsillar tissue or vice versa?

We have not yet found sufficient evidence to support us in the conclusion that infection of the peritonsillar area is dependent on infection of the crypts or parenchyma of the tonsil, at least not by direct continuity of tissue. I am rather inclined to the opinion that the glandular and lymphatic element of the tonsil plays an important role in the transmission of pyogenic infection to the peritonsillar tissue.

As the etiology of peritonsillar inflammation has not yet been definitely determined, our pathology and even treatment of this

condition still remains somewhat imperfect. The diagnosis and symptomology of acute suppurative tonsillitis and peritonsillitis is usually simple and requires no consideration in this paper.

Another observation to indicate that our knowledge of this acute inflammation is imperfect is the fact that no matter what line of treatment is instituted, the disease usually runs its natural course, terminating in abscess formation and spontaneous perforation.

Early surgical interference appears to me rational and sometimes even imperative to avoid sequelæ and the possibility of a burrowing abscess. I would not assert that an early incision made before the formation of pus can be determined, should be considered an abortive measure or one that will cut short the course of this affection, yet I wish to emphasize the importance of this procedure as a prophylactic and as a means of avoiding complications.

We select as the area of such incision into the peritonsillar tissue a point half way between the posterior pillar of the fauces, and the proximal edge of the uvula, about three-eighths of an inch inward from free edge of the soft palate. A guarded bistoury entered at this point in a direction downward and somewhat inward, cutting from the tonsil toward the median line, usually penetrates the most indurated portion of the peritonsillar tissue. I follow the incision of the bistoury by the insertion of a long, angular, narrow, blunt forceps, entering the wound with the forceps closed and then spreading the blades widely, and in this manner cause a fair-sized cone-shaped wound, with the base of the cone located in the depth of the supratonsillar fossa and with a small aperature at the entrance of the wound. The object of this technique is to produce a free drainage at the point where pus formation and abscess most usually occur, and to maintain but a small wound opening in the oropharynx, so that there may be as little opportunity for infection as possible. I pack this cavity with a half-inch strip of selvage-edge iodoform gauze, and direct the patient to keep the pharynx as clean as possible by the frequent use of antiseptic gargles and sprays.

If this surgical intervention has preceded the formation of pus, a natural free drain is already established when pus begins to form. This overcomes the necessity of the natural process of the pus forcing its way by pressure through the point of least resistence. This is most usually about the pillar of the fauces, but in some instances the spreading of the abscess may be directed into

1. The deeper cervical structures terminating in a perforation externally; 2. In a direction downwards accompanied by intense edema with the tendency of this edema to spread to the glottis; 3. The filling of the abscess sac upwards into the naso-pharynx, where the pharyngeal orifice of the Eustachian tube may be attacked and a consequent purulent inflammation of the middle ear ensue. 4. Where the deeper structures are involved and a free drainage is established with difficulty, necrosis may result, and in extreme cases the internal carotid artery or jugular vein may be attacked.

I believe that early incision, even before pus formation can be determined, is a wise prophylactic measure; even though we may not succeed in aborting the course of this process.

It may be of some interest to enumerate some of the conditions accompanying acute peritonsillar abscess and their radical treatment. Where early incision is undertaken, edematous infiltration of the adjacent tissues often occurs; for this edema prompt and free scarification is indicated. As a topical application to subdue such edema, my best results have been recently obtained with a solution of adrenalin chloride, 1:1000, sprayed or mopped on after scarification.

I place but little reliance on medicines given internally in this condition, but use sodium benzoate in 15 to 20 grain doses every three or four hours, alternating this with 20 to 30 drop doses of tincture of chloride of iron given at like interval.

Much comfort may often be derived by injecting a solution of 2 to 3 grains of menthol, 2 grains of camphor, 2 or 3 drops of oil of sandalwood to the ounce of benzoinol. This may be directed to the posterior nares by attaching a soft rubber catheter to a small syringe and passing it through the nares to the pharnyx. This is especially grateful in so many of these cases where the patient is unable to open the mouth, and where the pressure of the infiltrated tissues causes pain in the naso-pharynx with the extension upward to the ear or downward to the larynx.

In conclusion, then, I wish to emphasize: (*a*) that acute abscess formation in the tonsil per se is extremely rare; (*b*) that our knowledge of the place of entrance of infection into the peritonsillar tissue is still uncertain; (*c*) that the many measures thus far suggested to abort this condition have been unsuccessful; (*d*) that early surgical interference, even before pus formation has been established, is our best prophylactic procedure.

PAPER:

PERITONSILLAR SUPPURATION.

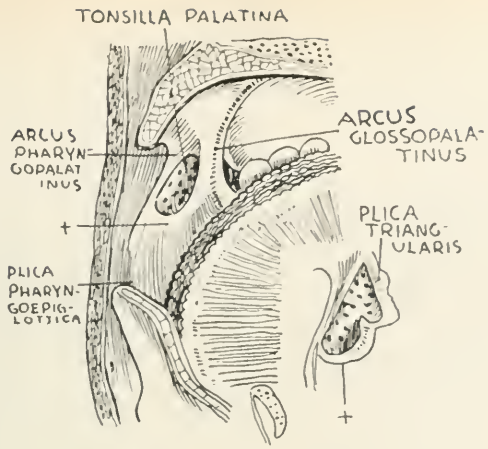
HENRY J. HARTZ, M.D.

The connection between circumtonsillar and tonsillar suppuration is so intimate that, for purposes of etiologic discussion, they may be considered as identical. Just as the brain and its blood-vessels are infected through a suppuration of the middle ear, so the circumtonsillar tissues are invaded secondarily to tonsillar and fossa disease; at the same time there are other sources of infection, such as caries of the teeth, nasal operations, abrasions of the pharyngeal membrane, etc.

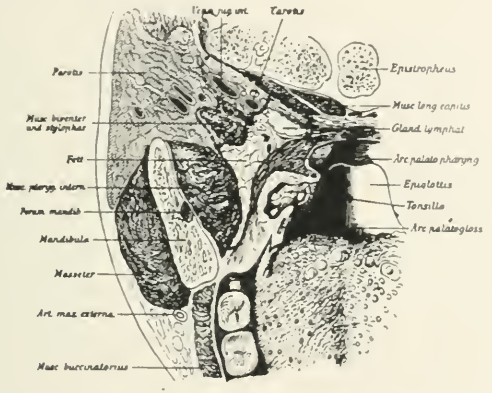
The tonsils are especially prone to infection owing to a constant evolutionary process or metamorphosis tending to obliteration, in evidence of which may be cited the fact that peritonsillar diseases occur chiefly in adolescents and junior adults (up to the age of thirty-five), or during the time that retrograde changes or atrophy of the lymphoid tissue obtain. The anatomic relationships of the tonsil with the plica triangularis and the supratonsillar fossa are important factors in the induction of tonsillar and circumtonsillar suppuration—the plica triangularis and the supratonsillar fossa become structurally altered, especially in children, as the result of disease. The inflammatory exudate produces not only adhesions, but likewise connective-tissue bands between the fossa, the plica, and the tonsils, that result in occlusion of the orifice of the former and of (some at least) the crypts of the tonsils. The secretions thus confined under pressure form a favorable nidus for the development of pathogenic bacteria that under normal conditions would remain innocuous. The ensuing inflammation and consequent hyperemia affect the integrity of the epithelium lining the crypts, the destruction of which may be only superficial in depth and microscopic in extent, but sufficient to allow the ingress of germs, and any obstruction of the crypt will favor the encystment of the pyogenic agents, thereby resulting in lacunar intra-follicular abscess. The suppuration may be encapsuled, or it may empty itself into the faucial space: Again it may extend outward toward the cellular investment of the tonsils to form a retratonsillar abscess: It may also discharge into the

supratonsillar fossa, or if, perchance, the orifice of this fossa is closed by adhesion, the pus is apt to burrow its way in the line of least resistance, entering the pharyngo-maxillary space, thereby inducing a typical peritonsillar tumefaction high up in the soft palate. The anatomic obstruction of the tonsil and fossa is brought about largely by the plica triangularis, which owing to its vascularity provides the material for adhesions.

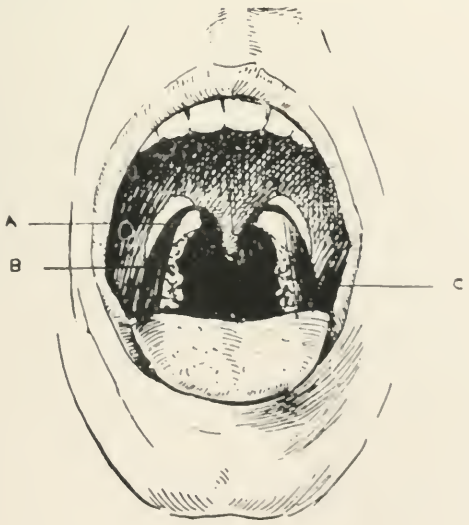
The plica is a triangular shaped membrane which has been termed the capsule and the operculum of the tonsil. It was first described by His, the German embryologist, along with the supratonsillar fossa, in 1885, and the designations thus bestowed by him are part of the world's nomenclature. The plica arises from the anterior pillar, which becomes visible at the fifth month of fetal life, and in a typical case extends from the upper posterior portion of the pillar backward and downward until it is finally lost in the tissues at the base of the tongue. From its position it often covers over that portion of space not occupied by tonsillar tissue and known as the supratonsillar fossa; it is likely also to obstruct the mouths of a number of the tonsillar crypts, thereby damming up the secretions and furnishing excellent culture grounds for germs. A plica adherent to the edge of the tonsil gives rise to the formation of elongated cavities extending one or two inches behind and toward the base of the tonsil. Also, some of the lacunar orifices may be obstructed by the envelopment of the plica, and thus secretions accumulating become decomposed, whereby the absorption of this morbid material may induce hypertrophy and suppuration extending often to the cervical glands, and is frequently the means of initiating an attack of circumtonsillar inflammation. The plica also is often adherent to the apex of a hypertrophic tonsil, both together obstructing the fossa. An abnormal amount of adenoid tissue may extend into the space sufficient to interfere with its capacity, predisposing the fossa to suppurative processes. The plica and supratonsillar fossa are nearly always demonstrable in the young and middle-aged; and coincident with atrophy of the glands the fossæ become shallow, and the plicæ recede toward the posterior pillars and traverse the inter-faucial spaces obliquely downward. The intent of Nature in providing the plica appears to be somewhat obscure, yet the consensus of opinion is that its purpose is to afford a support to the tonsil, and to protect its buccal surface from injury. The peritonsillar abscesses that have come under my personal observation have all exhibited an extraordinary, if not abnormal, development of the plica. This membrane,



Topography of the palatine tonsil, and supratonsilar fossa. (Zuckerkandl.) A portion of the buccal surface of the tonsil is covered by a mucous membrane fold (+) termed the plica triangularis, while the apex of the tonsil is hidden in the supratonsilar fossa. In the small sketch the upper portion of the triangular fold of membrane is divided, exposing the supratonsilar fossa and the apex of tonsil.



Horizontal section of the tonsil region. (Merckel.) The pharyngo-maxillary space is shown by dotted line. The carotid artery and internal jugular vein traverse this space.



A. Supratonsilar fossa (white portion extending upward between the anterior and posterior arch). *B*. The tonsils. *C* Plica triangularis.

too, sometimes retains within its folds and in the cavities decomposing substances that develop as the result of its adhesion, and thus often becomes a potent factor in the production of fetor of the breath.

Obstruction of the natural channels of drainage then, may be definitely held as one of the exciting causes of tonsillar and peritonsillar suppuration, though such predisposing factors as exposure to cold and wet, occupation, habits, age, etc., undoubtedly have a more or less remote influence. Another exciting cause is the presence of some of the ten varieties of cocci that obtain within the tonsil or mouth. The strepto- and staphylococcus are normally present, but innocuous until such time as predisposing factors permit them to multiply and develop inflammatory processes. Some difference of opinion exists as to whether the germs enter the tonsils primarily through an abrasion, or secondarily through the blood and lymph streams, and it is conceivable that both avenues may carry the infection. The lymphoid tissue of the tonsils and the contiguous regions with their capillary circulation, constitute a locus minoris resistentiæ, or a "physiologic wound" as Gerhard aptly terms it. Articular rheumatism following tonsillitis is in all probability caused by the deposit of germs by the blood or lymph channels in the serous membranes of the joints, and has been bacteriologically proved to be a suppurative process. It is true that malnutrition and the consequent deposit of crystalline material in the muscles and joints, usually termed uric acid rheumatism, is a predisposing factor in determining suppuration. About one-quarter of my cases of peritonsillar abscess had suffered from pain indefinitely described as, or termed rheumatic. The obstruction to crypts of tonsils and orifices of the supratonsillar fossæ are the chief causes of suppuration, in proof of which may be cited the fact that when the obstruction is thoroughly removed no recurrences take place, even in those cases that suffered from articular rheumatism.

The obstructions of the channels of drainage in the tonsillar region may be so firm as to force the purulent secretion to burrow in the pharyngo-maxillary space, and thus prolong the suppurative act. Moritz Schmidt reports cases of only one month's duration herewith both the tonsils and the pillars were successfully invaded. I, also, personally observed an instance in which, after an acute tonsillitis, the left throat was involved, including the posterior pillars, and wherein the pus ultimately made its way to the right throat, inducing so great congestion as to interfere with degluti-

tion—the liquid food ingested was regurgitated into the nose. In this case, oft-repeated incisions failed to reveal pus sufficient to account for the condition; but after two months a rupture occurred spontaneously in the region of the soft palate on the side first affected, and the patient recovered without further complication.

Recurring abscesses are mostly situated within the pharyngo-maxillary space. The danger and gravity arising from abscesses and erosion of the vessels of the neck cannot be too greatly emphasized, since the pus may burrow along the walls of the latter and thus reach the mediastinal space. That this space is in close relation to both tonsil and fossa, and that it nearly always contains purulent fluid, is apparently evidenced by the extreme bulging of the region of the soft palate. This tumefaction is apt to prove most misleading, as it merely differentiates the highest point of the abscess cavity and not the spot where there is the greatest accumulation of pus; consequently the classic incision midway above the superior arch is in these cases ineffective.

In two cases, wherein I was summoned late, I incised the abscess at its lowest point, which was near the wisdom tooth of the lower jaw.

When an incision is made, it should be by means of sterilized instruments in order to prevent mixed infection, and frequently the abscess is due to the action of one species of germ alone. Leland's method of using the sterilized finger after incision with a view of tearing the tonsillar tissue and thus reaching the pus-sac, seems a painful (and withal in a hard tonsil is an impossible) procedure, but it has the advantage of locating the direction of the abscess and is free from the danger of wounding the branch of the ascending pharyngeal artery in the anterior pillar of the fauces. Instruments of a blunt character, as employed by Pierce and Kyle, permit of opening the supratonsillar fossa without danger to this blood-vessel.

To avoid recurrence of peritonsillar abscess, it is essential that the abscess cavity be irrigated and drainage established from its most dependent part. It is my experience that while tonsillotomy and ignipuncture may hinder recurrence, such is not always infallible. Radical excision of the upper part of the tonsils, or removal of the plica triangularis, and breaking up of adhesions wherever the channels of drainage are obstructed, are to be recommended. Sometimes curettement of the fossa, followed by an application of trichloracetic acid, is sufficient. Obliteration of the crypts of ton-

sils is best accomplished by extirpating the entire gland, although the punch forceps have proved of great utility in my hands in cases where but a few crypts were diseased. I have employed the galvano-cautery loop and cautery knife with good effect in some instances, and thus rendered the operations practically bloodless; the use of suprarenal extract also aided to free the field of operation from sanguineous effusion. Operations upon the plica are more painful than upon the tonsil, but the topical application of a ten per cent. solution by eucain and infiltration of the tissue by Schleich's mixture will mitigate the pain sufficiently for all practical purposes. When adhesions of the apex of the tonsil are deep in the floor of the fossa, and firm to the semilunar margin of the anterior pillar, two vertical incisions may be made, one between the anterior pillar and the tonsil, and the other between the tonsil and the posterior pillar, extending well up into the soft palate; the gland can then be seized and dragged to the median line where a horizontal incision severs it, when the remaining lymphoid tissue may be removed by the scissors—an operation that leaves the supratonsillar orifice wide open.

The pathology of acute septic inflammation renders it unlikely that drugs can be of much value in the management of these maladies. Sometimes, if seen early, they may be aborted by a liberal dose of mercurous chlorid—such is always indicated in suppurations—followed by the administration of tincture of veratrum or tincture of aconite (which may also be combined or given alternately) every half hour, in one-half minim doses, until a relaxing effect upon the arteries obtains and full diaphoresis is established. Local scarification and topical application of heat will assist in reducing the congestion and in dispersing the accumulated fluids, but after twelve hours' treatment, if no abatement of inflammation is had, medication should give way to operative processes. The local application of heat and inhalation of vapors, together with rest in bed, are of extreme value. Gargling is too painful a process to recommend, but a local spray of four per cent. solution cocain is grateful whenever the pain is intolerable. All else failing, on the third or fourth day an incision may be made under local anesthesia at the lowest point of tumefaction, which will cooperate with the advancing suppuration and favor an early termination of the abscess.

In summarizing, I would emphasize:

That the obstruction of the orifice of the supratonsillar fossa, and the orifices of the crypts of the tonsils, predisposes to circum-

tonsillar suppuration directly, and any vulnerable part of the organism remotely.

Early incision at point of origin, which is usually within supratonsillar fossæ, or within the crypts of the tonsils.

Chronic latent tonsillar abscesses may initiate an infection, developing pneumonia, pleurisy, pyemia, or septicemia.

That the coccus variety of germs may be temporarily encapsuled within a ball of connective tissue.

That articular rheumatism, consecutive to tonsillitis, is a suppurative process produced by invasion of cocci through lymph or blood channels.

That uricacidemia does not cause suppuration, but may predispose thereto.

PAPER:

ACUTE LACUNAR INFLAMMATION OF THE TONSILS.

MARSHALL R. WARD, M.D.

The essential morbid lesion in acute lacunar tonsillitis is a catarrhal inflammation affecting chiefly the lacunæ or crypts of the tonsils. The process may be limited to a few crypts in one or both tonsils, or the entire lymphatic tissue in the pharynx may be involved. It occurs rarely as a primary disease, and is usually associated with a general catarrhal inflammation of the tonsils and naso-pharyngeal structures which doubtless acts as the chief predisposing cause of the tonsillitis.

Its infectious nature is no longer in doubt, and the intensity of the disease varies according to the form of infection, its location, and the natural resistance of the patient. This will account for the comparatively mild systemic disturbance in some cases, and the profound toxemia in others. So far, no one has yet been able to isolate the specific micro-organism upon which it depends. Viellon[1] believed it to be due to the streptococcus pyogenes, which he found present in all of the twenty-four cases which he examined.

Meyer[2] in the analysis of 53 cases, found staphylococci in 14, streptococci in 15, and a mixture of staphylococci and streptococci in the remaining 24 cases. He found also a diplococcus closely

resembling that of pneumonia. Tubercle bacilli and Klebs-Loeffler bacilli have been found occasionally in the bacteriologic examinations of acute lacunar inflammation of the tonsils. Their presence is believed to be merely an accidental occurrence. It must be remembered that a great variety of pathogenic bacteria have been found to exist in the throats of perfectly healthy individuals. This, doubtless, can be explained by the normal tissue resistance, or what is commonly known as phagocytosis. The natural inference, therefore, would be that these organisms are of secondary importance as etiologic factors in diseases, the chief predisposing cause being some inflammatory process, which first weakens the physiologic resistance of the mucous membrane.

This may be sudden exposure to cold, lesions of adjacent structures or a lowered general vitality of the individual due to some constitutional dyscrasia or toxic material circulating in the blood.

Intra-nasal and pharyngeal operations are frequently associated with acute lacunar tonsillitis. Their etiologic relation is of considerable interest and importance to every nose and throat specialist. No matter how carefully these operations may be performed, or what precautionary measures may be taken in the after treatment, a certain proportion of the cases will be followed by acute lacunar inflammation. Granting that ordinary antiseptic precautions have been taken, this may be explained by:

I. The open wound acting as an accessible point of entrance for the bacterial infection, the poison being conveyed to the tonsils through the neighboring lymphatics.

II. Certain pathologic changes in the naso-pharyngeal structures due to the irritating effects of plugs or dressings within the nose.

III. The local and constitutional effects of the cocain, which weakens the natural resistance of the patient.

Chronic enlargement of the tonsils naturally invites recurring attacks of inflammation. This is especially true if the tonsils are undergoing what is commonly described as follicular degeneration. The retained secretion decomposes, distends the lacunæ, weakens the lining membrane by interfering with its blood supply, thereby furnishing the chief requisite condition for bacterial infection. Ulceration and necrosis may occur at any point within the lacunæ, and give rise to a parenchymatous tonsillitis.

Much has been said and written on the tonsils as portals of entrance for pathogenic bacteria. There can be little doubt that

many of the acute infectious diseases owe their origin to micro-organisms, introduced into the system through the tonsillar crypts. They are favorite breeding places, veritable incubators for all kinds of bacteria, particularly the staphylococci and streptococci. The protective epithelium within the crypt once denuded, nothing is to prevent these organisms from entering the lymphatic and circulatory systems. This will account for the frequent association of acute lacunar tonsillitis and rheumatism, endocarditis, myocarditis, nephritis, and many other infectious diseases. It is a mistaken idea to suppose that they have any other relation than a common bacterial one. The first effect of the micro-organisms is manifested on the tonsils, and to their systemic absorption through the tonsillar crypts, the rheumatic and other infectious processes so frequently associated owe their origin.

Wagner,[3] of San Francisco, has been able to demonstrate in the urine and synovial fluids of patients affected with rheumatism and tonsillitis, the same identical micro-organisms. The theory of the microbic origin of rheumatic fever is to-day pretty generally conceded, as may be seen by Maclagan's[4] article on "Rheumatism" in the Twentieth Century Practise of Medicine; also, the recently published report of a discussion[5] on rheumatic fever at the annual meeting of the British Medical Association.

Acute lacunar tonsillitis occurs most frequently between early life and adolescence. This is explained by the abnormal development of the lymphatic tissues during this period of life. While the faucial tonsils are most likely to be affected, the disease is by no means confined to these structures. Any portion of the so-called tonsillar ring may show numerous white pultaceous masses, marking the lacunæ or crypts concerned in the process. This is especially true of the lymphatic or adenoid tissue in the vault of the pharynx, often the only part affected, and escaping our notice, unless a post-rhinoscopic examination be made. Ordinarily the diagnosis can be made by direct inspection, but not always so. While the anatomic appearances are quite characteristic, a bacteriologic examination should always be made to ascertain, if possible, the presence of a mixed infection, which not infrequently occurs.

Is acute lacunar inflammation of the tonsils contagious? To a moderate degree, yes. Abundant clinical evidence can be produced in support of this theory. We not infrequently find it epidemic, running through whole families, besides affording abundant proof in other instances of direct communication from person

to person from a single exposure. Being distinctly a microbic disease, all that is required to make it contagious is exposure, and the necessary receptive condition of the patient.

It is needless, here, to do more than simply mention the cervical-lymphatic and ear complications of this affection. The extent of destruction done to these structures will depend largely upon the specific organism concerned in the process—the streptococcus naturally being the more destructive in its results, and most likely to be followed by suppuration.

The treatment of acute lacunar inflammation of the tonsils is both local and constitutional. Much confidence is expressed by some physicians in their ability to abort this affection. Personally, I cannot lay claim to any such superior skill. I wish I could. The remedy which is supposed to possess such magic power is the local application of guaiacol. It has some antipyretic and antiseptic properties, and is also a local anesthetic to a slight degree. This is all, I think, that can be justly claimed for it. I cannot recall a single instance wherein I have been able to successfully abort an attack of acute lacunar tonsillitis. As well might we claim to abort typhoid fever, diphtheria, or any other of the infectious diseases. All we can hope to do, by local treatment, is to modify the severity of the disease, as it is self limited, lasting at most but a few days. If the lacunæ or crypts are distended with confined secretion, they should be evacuated by a blunt probecuret, care being taken not to denude the epithelium more than is possible.

The indiscriminate local treatment of the crypts, digging and probing in the vain hope of dislodging or destroying the poison supposed to be lurking therein, is, I dare say, productive of more harm than good. As a routine treatment, I have been in the habit of using the following combination:

℞ Acid carbolic ..... gtt x
Acid boracic
Soda biborate ..... aa ℥iss
Hydrogen dioxid
Borolyptol ..... aa ℥i
Aquæ dest ..... q.s. ad f℥viii

M. Sig. Use as a spray or gargle every two hours.

Small particles of cracked ice, or ice-water in the form of a spray or gargle, is of decided benefit in the early stage of the disease. If there be indications of any extensive lymphatic involvment, the ice-coil may be used.

The constitutional treatment consists in free purgation with calomel or effervescing phosphate of soda. For the fever, headache and muscular pain, I usually combine codein sulphate, salol and phenacetin, in proportions to suit the age and requirements of the case. If there is a previous history of rheumatism, I rely on the salicylate of strontium or soda in preference to the salol.

The tincture of chlorid of iron is a time honored remedy, the value of which cannot be over-estimated in this affection. It has a decidedly beneficial local effect, besides a selective action on the blood and kidneys. It should be given during the acute stage of the disease and continued far into the convalescence.

As one attack of acute lacunar tonsillitis predisposes the patient to recurrent attacks, it goes without saying that these offending and apparently useless organs, the tonsils, should be removed without delay during the quiescent stage. Under no circumstances should any operative procedure be employed during the active period of the disease.

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Park Bldg., May 18, 1901.

PAPER:

PHARYNGO-MYCOSIS.

BY ARTHUR G. ROOT, M.D.

Pharyngo-mycosis is a somewhat uncommon chronic affection in which a fungus is developed at the mouth of the follicles or in the tonsillar crypts. Occasionally the growth extends to the pyriform sinuses and into the larynx. Leptothrix and bacillus fasciculatus are the fungi usually found in the deposits. It is most commonly a disease of adolescence and is supposed to be more frequent among females than males. There are many and various opinions as to the exact bacillary cause, in fact, there are nearly as many opinions advanced as there have been different authors. In a study of the history of the growth do we find our pathology.

The process is a slow growth, gradually spreading from one or two points, and presenting no symptoms save those of an objective character. The microscope usually shows well-formed mycelia within the mass, with sprouting tufts, holding more or less secretion in a process of degeneration, leucocytes, dried mucin, epithelioid cells.

These cells do not seem to be of deep origin, but appear to attach just inside the mouths of the follicles. The tissues of the surrounding parts are seen to be swollen and edematous, but the general nutrition of the part is not materially interfered with, as the lymph channels are not disturbed to any great extent.

I have said that the symptoms of this disease are almost entirely objective, for the patients might, and indeed do, often go on for a long time without knowing of the existing condition until they happen to see some of these whitish spots in the throat, or are told of them by some one making an inspection of the throat in consequence of an attack of tonsillitis, or something of the sort. Indeed, mycosis is often mistaken under the diagnosis of follicular tonsillitis; slight soreness and stiffness of the throat may present, and patients often complain of a disagreeable taste. Upon inspection the appearances are quite characteristic. Dotted here and there over the surface will be noticed small, pearly-white tufts, very distinct and separate, rising above the surface of the

epithelium, and clinging tenaciously to the structures. Upon attempting to remove these spots or tufts with a probe or cotton swab, it will be found quite impossible to do so, for they are imbedded deep in the tissues and are of a spiral formation. Considerable force is required to pull out one of these little plugs and after removal the growth quickly reappears. If the disease has been present for a long time, it is occasionally found that these small tufts will coalesce or run together, and all the pharyngeal structures, together with the base of the tongue, become involved.

It is not likely that this condition will be confounded with anything else unless it be chronic follicular tonsillitis or a diphtheritic process, and a little study of the case will easily clear the diagnosis. I am not one of those who hold that mycosis is a pretubercular condition, although a low state of the general health and digestive disturbances do probably in a measure predispose.

As to treatment, many things have been recommended, and the essential thing, aside from building up the patient's general health, is to destroy, as far as possible, all of the fungoid growth, removing by the use of curet or forceps. Applications of carbolic acid, chromic acid, and various astringents and antiseptics are used, but nothing does so much good as to remove all infected tissue, as far as possible, by means of the curet, forceps or tonsillotome. When this is difficult or impossible, use the galvanocautery point.

All of these cases require long periods of treatment and much patience upon the part of both physician and patient.

In my own practice I recollect several cases, two of which occurred in females of one family, both cases having been looked upon as tonsilitis, each patient making a complete recovery after some months.

PAPER:

GLANDULAR COMPLICATIONS OF TONSILLITIS AND PERITONSILLITIS.

BY TALBOT R. CHAMBERS, M.D.

It is a matter of deep regret to me that under this heading I am unable to bring before your consideration anything new or startling. And, after consulting the extensive bibliography on the subject and a limited personal experience, I shall simply record a few personal convictions.

In the first place, it has been asserted that the tonsil is not a gland. How is this reconciled with Osler's statement, that there is cytogenic action of the glands including the tonsil? Why does the swollen tonsil diminish on the administration of Guiac, which it does? The tonsil certainly contains a system of lymph vessels in direct connection with the vast system of the surrounding tissues. This it is that makes it a wonder that in infectious tonsillitis, the other glands are not always seriously involved. Before the microscope and serum application to suspicious cases of acute throat troubles, what a comfortable aid to diagnosis was the swelling of the cervical glands, which confirmed the fear of true diphtheria.

During the past year, gland involvement, in my experience, has not been a frequent occurrence; and those coming under my notice, have been chiefly in dispensary practice.

Guiac, in small and frequently repeated doses, has caused a subsidence of the acute swelling of the submaxillary and other glands, even of the parotid, in a number of cases. In chronic cases Iodine and Ol. Morrhue have given positive proof of the efficacy of the combination.

Enucleation is to be prefered to incision and curettage. The wound heals by first intention generally, whereas the fistula left after incision is sluggish and often unsatisfactory.

Rubbing or bruising of acutely or chronically inflamed glands, is most reprehensible, for it defeats the very purpose for which it is done.

I have to report an unusual number of cases of what Jona-

than Wright calls pachydermis laryngis, confined to that portion of the pharynx just behind the posterior palatal pillar. My attention has been called to this condition by ear symptoms, such as deafness, otitis media and even mastoiditis. These were complications of what is known as the hidden tonsil. Enucleation of this hidden tonsil has, in a number of instances, set free a surprising amount of unsuspected mucus and smegma. It should not seem strange that these collections of foreign matter, situated so near the opening of the Eustachian tube, would have so direful influence upon the auditory apparatus. I am convinced that in certain cases successful treatment of otitis media and mastoiditis must be supplemented by curing this pachydermis laryngis. The employment of Adrenalin and cocaine has robbed the operation of most of its difficulties. After removal of the hidden tonsil, the treatment of the hypertrophy of the mucosa becomes simplified, and it yields to suitable constitutional and local measures.

PAPER:

MALIGNANT DISEASE OF THE TONSIL.

F. E. HOPKINS, M.D.

This symposium on disease of the tonsil is of such extent and richness that my individual contribution to it may well be brief and aim at the presentation of only the most practical phases of the subject. I shall not try to produce a complete monograph upon malignant disease of the tonsil, but rather to stimulate discussion which shall add something of value to our common fund of information.

Cancer of the tonsil occurs but rarely. At least one recent textbook on diseases of nose and throat makes no mention of it, and Bosworth in his work on "Diseases of the Throat," edition of 1892, says that he has had no personal experience with sarcoma of the tonsil; and he records in this same edition that of carcinoma of the tonsil Lennox Browne has seen but 12 cases—about 1 in 5,000—in a practice extending over a period of 20 years, and Mackenzie has seen but 7 cases. These statements apply only to primary disease of the tonsil, which is the point under consideration. Although rare, the disease is of such gravity, and demands

on the part of the surgeon the exercise of such a degree of judgment and skill, that place is well given to its discussion at this time. The résumé of some recent thought on malignant disease of the tonsil and your discussion of the subject cannot fail of interest and profit. Butlin,[1] moved by the practical requirements of the situation and the similarity of results to be expected with either sarcoma or carcinoma, considers the two together, saying that they appear to be equally and in essentially the same manner fatal, and he includes both under the common name of malignant disease or cancer. It will tend to simplicity if we follow the same general plan, mentioning a few points in which the two forms of neoplasms differ. Because of the character of the growths most frequently seen, a still further simplification is possible. In the process of development sarcoma of the tonsil, following in a measure the form of lymphoid structure in which it occurs, becomes a round celled tumor. As a rule carcinoma occurs at a later period in life than sarcoma, and at a time when the lymphatic structures of the tonsil have undergone certain retrograde changes, but the epithelial structure persists. If, as a result of local irritation, heredity, or whatever unknown cause, nutritive activity undergoes an abnormal increase, we have the conditions which may prove the starting point of carcinoma. It would be expected then that the form would be epithelioma, and it is found in the great majority of cases that this is true. If, then, a case of malignant disease of the tonsil comes before one, the diagnosis lies between a round celled sarcoma and epithelioma.

Males are much more subject to cancer than females. Bosworth,[2] commenting on this fact, says: "We usually expect to find a larger number of cases of malignant disease among males than females, but the preponderance here is perhaps unusual and is only to be still further accounted for by the fact that the habits of life, and the exposures to which men are subjected, lead to the development of disease of the upper air passages, which may possibly exercise a certain predisposing influence in the development of malignant disease."

Epithelioma of the tonsil quickly ulcerates, forming flat plaques or deep and foul ulcers. The reason for this is that the primary development of an epithelial cancer is superficial, and the faucial region being in a state of constant functional activity, the surface of the neoplasm is subjected to friction. Sarcoma more frequently forms a rounded, smooth, distinct tumor, in the early stages not ulcerated and appearing like simple hypertrophy of the

tonsil. Ulceration occurs later and begins at a point which comes in contact with some other surface; as, for example, the base of the tongue.

It is stated that carcinoma in its progress tends to invade tissue forward toward the base of the tongue, while sarcoma extends backward.[3] Sarcoma also penetrates the tissues of the neck, and in both forms the cervical glands become early involved. This circumstance is explained by the intimate connection between the tonsils and the cervical lymphatic glands. Almost any ordinary inflammation of the tonsils may be accompanied by enlargement of the cervical lymphatics. Much more would a malignant process be expected to show this involvement. This fact has an important bearing on the plan to be followed in operating for removal of cancer. Time hardly need be given to consideration of etiology and pathology, for the new growths follow a course of development similar to cancer in other localities.

Symptomatology.—Sarcoma begins insidiously, and the only symptoms may be those of mechanical interference with the faucial functions of respiration, phonation and deglutition. At a late stage respiration and deglutition may be so interfered with as to call for tracheotomy and artificial feeding. The new growth in the throat excites a flow of mucus, and the difficulty in swallowing causes its accumulation, so that the mouth is filled, much to the patient's discomfort. If ulcerative process is going on, the mucus is of an irritating character and ill smelling. Hemorrhage may be a notable symptom, usually at a late stage, and is sometimes the cause of death. As already remarked, the neoplasm sometimes invades the tissues of the neck early and appears externally, the external part growing rapidly. It is this invasion of tissue and the extensive involvement of lymphatics which often renders operation so hopeless a procedure. So far as symptoms are due to the presence of a tumor in the fauces, carcinoma resembles sarcoma, but pain is likely to be an earlier and more troublesome symptom with carcinoma. Pain of a sharp and lancinating character, shooting up into the ear, often accompanies the development of carcinoma, increasing with the growth of the tumor until it is almost constant. Reflected pain located in the ear has been so prominent a symptom as to lead to the treatment of the ear in the early stage of this disease of the tonsil. The cervical lymphatics are involved earlier in the progress of the case than with sarcoma. Ulceration also occurs earlier With the increase of the size of the tumor, and the consequent

greater interference with nutrition, there is loss in weight and strength; and from sepsis attending the ulcerative process or that peculiar poisoning attending the progress of cancer, we get the condition recognized as cancerous cachexia.

Diagnosis.—The occurrence of a unilateral enlargement of the tonsil in an adult, especially if of recent development, at once excites suspicion of malignancy; and yet with all the aids which can be gained from clinical history and microscopical examination, the diagnosis in the earlier stages is often far from easy. One must differentiate between simple hypertrophy, syphilitic manifestations, tuberculous process and even phlegmon; at least there is record that general practitioners have pronounced as phlegmon what proved later to be sarcoma. It will not be without interest to cite cases in which these conditions have been met, for this will not only prove the statement, but the history of the cases illustrates methods followed in securing diagnosis. Of syphilitic manifestations no better case could be quoted than that of Delavan, reported to the American Laryngological Association at its meeting in 1897. Here the clinical history and microscopical findings were doubtful, and the case was only cleared up by the use of specific treatment. The report is as follows:[4]

"About two months before consultation began to notice soreness of left side of pharynx. The tonsil began to increase in size, although prior to this time there had never been any trouble with it. As the enlargement continued the tonsil became inflamed, and finally began to break down, an erosion appearing near the center of its surface.

"The clinical appearances of this case were highly suggestive of sarcoma. Although the family physician was a well-known practitioner of unusual ability and experience, neither he nor myself were able to find the slightest evidence of syphilis after repeated careful examinations. The patient was a gentleman of excellent intelligence and social position. He was aware of the gravity of the situation, and of the danger of the operation necessary for the removal of a malignant tumor of the pharynx, and while professing the utmost willingness to aid us by every means in his power positively denied the knowledge of having contracted specific disease. In order to arrive at a diagnosis as speedily as possible, a fragment of the diseased tissue was removed and sent to Dr. Eugene Hodenpyl of the College of Physicians and Surgeons, New York. The first report of the pathologist expressed a doubt as to the nature of the lesions, although several other

microscopists who saw the specimen considered the case one of sarcoma. A second small fragment was removed and examined about ten days after the first, and this also gave a like negative result.

"The entire tonsil was now removed by means of a cold wire-snare, and the mass thus separated was sent to the pathologist. Again the general verdict was sarcoma, excepting on the part of Dr. Hodenpyl."

As illustrating the difficulties in differentiating between sarcoma and simple hypertrophy, the following report of a case which came under my observation is in point:

Paul W., 13 years old, was brought to me by Dr. G. H. Janes on Aug. 6, 1896, with the statement that during the preceding June he had been operated upon for the removal of suppurating cervical glands upon the right side. No microscopical examination was made, but the surgeon regarded the adenitis as a tubercular process. At the time of the removal of the lymphatic glands the tonsils were not especially enlarged, and no attention was called to them. Upon his visit to my office the right tonsil was so much enlarged that it nearly filled the oropharynx. There was no pain, no ulceration, and the anoyance was simply a mechanical one. Because of the history and rapid development I considered it either a tubercular or sarcomatous growth. It was removed with the galvao-cautery snare and submitted to Dr. Jonathan Wright for examination.

His report is as follows: "Oct. 7, 1896. Specimen from tonsil examined to-day. It seems to be simple lymphoid hypertrophy of the character one usually meets with in a tonsil. I see no evidence of tuberculosis or of sarcoma. From the history I should think of the latter. This is one of the many cases in which the microscope in my hands does not help much, as either tubercle or lymphosarcoma may be at the bottom of the trouble. All that I can say is that I can see neither in the sections I have examined."

On May 7, 1897, the patient returned saying that for several months there had been no symptoms referable to the throat, when about April 1 it began to grow again, and increased in size so rapidly that it was now nearly as large as when first removed. There was no pain and no enlargement of lymphatic glands. A small area upon the anterior surface which came in contact with the base of the tongue was eroded. With this exception the appearance was very like that nine months earlier. The growth was

again removed with the hot snare, the base subsequently cauterized, and three months later the pharynx appeared normal. Dr. Wright pronounced this recurrence simple hypertrophy. On Feb. 5, 1898, there was again recurrence, which was said not to have occupied more than six weeks in its growth.

Of this Dr. Wright wrote as follows: "March 4, 1898. Recurrent tonsil, hardened and embedded in celloidin and cut shows dense structure made up of round cells without lymph-nodes, with very scanty stroma, the cells so grouped around the blood vessels as to make it extremely probable, in view of the history also, that we have here to do with a lympho-sarcoma of a malignant type, but this can only be asserted positively, if at all, by the examination of circumjacent tissue. You are, therefore, thrown on the clinical aspects of the case for your decisive diagnosis."

It is not necessary here to give later details of this case. The patient died of recurrence early in July, 1899, three years from the time he first came under my care.

Simulating phlegmon of the tonsil is Gaudier's case.[5] The patient, male, 35 years old, was sent to Dr. Gaudier with the diagnosis phlegmon of left tonsil. Two exploratory incisions had been made, but no pus found. He complained of difficulty in swallowing, in opening the mouth, and in turning the head to the left side, but not of pain or tenderness. No enlarged glands were found in the neck, there was no fever, and the general condition was good. A large tumor was situated between the anterior and the posterior pillars on the left side, stretching the former forward and the latter backward, pushing the soft palate upward and the uvula toward the other side. The tumor was elastic all over, but nowhere fluctuating, and was about the size of a mandarin orange. On its surface, "like a cap," sat the apparently normal tonsil. A slight wound made in the tumor gave rise to profuse bleeding. At this time the symptoms had been present only eight days.

A diagnosis of rapidly-growing small-celled sarcoma was made, and no operative treatment was attempted.

Fifteen days later patient was scarcely able to swallow at all, and had difficulty in breathing both by the mouth and by the nose. The tumor had increased to the size of a large orange, extended forward between the upper and lower teeth, and upward behind the soft palate. The whole tumor was removed. Patient died rather more than a month later of pneumonia. Mi-

croscopic examination of the tumor showed it to be a very vascular small-celled sarcoma, with some myxomatous portions.

While a local tubercular process might simulate carcinoma, it would not be primary, but accompanied by such evidences of general infection as to leave no room for doubt; yet it is not impossible that malignant disease of the tonsil should exist along with a general tuberculosis, in which case the diagnosis might for a time be very puzzling. After all is said, the diagnosis in the individual case must be determined by careful consideration of the clinical manifestations aided by microscopical examination. And of course every effort should be made to secure diagnosis at the earliest possible moment, since it is but a truism to say the best hope of successful operation lies in early and complete removal.

The prognosis is most serious. It is unnecessary to weary you with statistics,—a sentence from Butlin[6] well sums up the situation. "The disease proves fatal in very many instances within a year, or even six months, of its first appearance; indeed, few fersons survive for more than three-quarters of a year."

In the matter of treatment the method of operating is of the first interest and importance; for while other plans may have to be entertained in cases which are plainly inoperable, thorough removal with knife, snare or cautery is the first thought in presence of this disease. If one sees the case early, and especially if it be sarcoma, an operation through the mouth may properly be performed. This statement is made on the supposition that the new growth has not invaded surrounding structures, and that the cervical lymphatics are not seriously involved. Indeed, A. Frankel[7] advises this operation even in carcinoma, but would first ligate the carotid, probably with the idea of lessening the nutritive blood supply of the part rather than from fear of hemorrhage at the time of operation. The idea of trying to shell out the growth with the finger or blunt dissection would seem to offer better promise of thorough removal than by the knife or cautery, though Butlin says of cases thus treated "unfortunately they are not less prone to recur." In my own case, though the carotid was tied, and the mass apparently thoroughly enucleated by the finger, yet recurrence was as rapid as when earlier it had been removed by the galvano-cautery snare. Bosworth[8], encouraged by success in use of the cold-wire snare in removal of sarcoma in other regions, recommends it here. Whatever method is followed, thorough removal is the desired object. Any enlarged

lymphatic glands should certainly be removed, and if the carotid be ligated the internal alone would doubtless answer as well as the common. Nutritional activity of the part ought thus to be more effectually hindered. As to the external operation, I have never seen this performed and cannot do better than describe the method as followed by surgeons of note. Cheever is credited with having been first to perform the operation for removal of the diseased tonsil through an incision in the neck. Some who have followed have modified the operation, making it considerably more formidable. The following case reported by McBurney is of interest, and its description includes the explanation of this plan of operating. This was a case of carcinoma of the left tonsil, and the cervical lymphatics were extensively involved. Diagnosis confirmed by Dr. Prudden.[9]

"Preliminary tracheotomy was first made to facilitate etherization and the subsequent treatment of the wound. A long, straight incision, from the lobe of the ear downward and corresponding to the anterior edge of the sterno-cleido-mastoid muscle, was made. Through this a thorough removal of all lymphatic glands and connective tissue was easily accomplished. The external cartoid artery was ligated close by its origin. Then a straight incision, about at right angles to the first, was made, passing upward and forward, and crossing the jaw at about the situation of the last molar tooth. The submaxillary gland and all connective tissue and lymphatic glands below the jaw were removed. The jaw was then divided with the saw in the line of the second superficial incision. It was now easy to draw outward the ramus of the jaw, and so completely expose the whole external surface of the tonsil, the large vessels and pneumogastric nerve being drawn backward. The pharynx was then entered with the knife at a point about one-half inch anterior to the edge of the tonsil. The knife was then carried upward well into the soft palate, backward and then downward, always at a considerable distance from the tonsil, until the tonsil, a portion of the posterior edge of the tongue and of the soft palate, and the whole lateral wall of the pharynx were removed. The divided jaw was sutured with silver wire, and the superficial wound partly closed by suture. The deep wound was packed down to the pharynx with iodoform gauze."

At the time this report was made nearly three years had elapsed since operation, and there was no evidence of recurrence. This operation, formidable though it is, gives opportunity for the dissection of involved glands, and thus the more complete re-

moval of all diseased tissue. If a general rule were to be formulated it might well be: Enucleate the tumor with the finger and blunt instruments, if the case is seen early and before the surrounding structures are invaded. Remove also cervical lymphatics, if these are involved. If the new growth has passed beyond the stage which admits of this shelling out process with reasonable hope of successful issue, then the external operation is to be performed. What shall be done in those cases which are inoperable when first seen, or have become so? The palliative removal of the growth, to permit of swallowing and breathing, has already been referred to. This might well be done by blunt dissection rather than by cutting. Successful results have been reported by methods of treatment other than radical removal.

Allusion may here be made to Hubbard's case [10] of epithelioma of the soft palate treated by injections of liquor potassæ. Diagnosis was confirmed in this case by Dr. Jonathan Wright. The patient lived nearly two years after the beginning of treatment, and for most of that time was in good health. He died of cardiac lesion.

Dr. W. B. Coley wrote me that he had treated a case of sarcoma of the tonsil with the injections of the toxins of erysipelas, after the method which he had made so well known. Though the patient died of recurrence, it was after an interval of eight years, which is a noteworthy showing.

Dr. Massey[11] has reported cures by the cataphoric destruction of cancer cells. Among his successful cases one was a carcinoma of the tongue, another a sarcoma of the upper maxilla. He uses a current of such power that one would hesitate to employ it in the throat, in such close proximity to important nerve trunks. Yet in so desperate a situation it gives a sense of satisfaction to know of every possible resource which may be available.

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DISCUSSION.

Dr. JONATHAN WRIGHT, of Brooklyn, opened the general discussion. He said that the structure of the normal faucial tonsil is practically the same as that of the lymph glands. Long ago Huxley made the statement that the tonsil is a diverticulum of the pharynx around which the lymph glands were thrown. The theory of phagocytosis has been greatly modified of late until now it is believed that it is the juice of the lymph cells which serves to protect the body from invasion. The protective influence of lymphoid tisue has been thrown around the diverticula found at various mucous places; this was probably because in these clefts bacteria would find easy lodgment. In the nose there is not the same reason for the development of such lymphoid structures; but there is a special necessity for such protective influence in the pharynx, which receives the drainage from the nasal cavities, the ingestion of food by the mouth, and the upheaval of mucous particles from the bronchi and trachea. Before dust particles or bacteria can reach the terminal branches of the bronchial tree, they must be deposited upon the mucosa, and be cast upward by the ciliated cells to the pharynx, and it is just here that the lymphoid tissue of Waldeyer's ring is found.

Dr. FRED. C. COBB, of Boston, said that it seemed to him that most cases of acute peritonsillar abscess could be traced to a prior acute tonsillitis, though in many instances of abscess on first coming under observation there is no sign of the precedent tonsillitis. The tendency now is to make the incision between the pillars rather than in the classical position in the anterior pillar. If the cut were at the right angle to the direction of the pus, the latter might or might not be reached. By cutting in the direction of the pillar, one cuts in the direction in which the pus is going, and it is more easily reached. Looking over twenty cases, he found three that had been opened to the supratonsillar fossa had closed again. In his hands a much larger percentage would close, if the incision were made in the old, so-called, point of election. He had seen a peritonsillar abscess develop in the lower part of the tonsil after the upper part had been removed. In lancing peritonsillar abscesses two kinds of cases are to be considered: 1. Those in which pus is for the most part between the anterior pillar and the tonsil, and 2, those in which the pus is in the anterior

pillar. If the pus is in the anterior pillar, the pillar will be slanted forward and the posterior pillar backward, and vice versa; hence, one could decide whether to lance through the anterior or posterior pillar, or through the supratonsillar fossa. The speaker said that he had taken measurements of the depth of the average peritonsillar abscess cavity from the edge of the anterior pillar, and found it to be one and one-eighth inches. If, therefore, the knife penetrated three-fourths of an inch the operator might feel safe.

Dr. Lewis A. Coffin, of New York, endorsed what Dr. Hartz said regarding the etiology of peritonsillar suppuration. If the drainage of the nose were defective very slight causes would be sufficient to provoke inflammation. He was still sufficiently old-fashioned to make use of the old iron mixture, believing it to be very much better in a very large number of cases than the use of the salicylates or of guaiacol. He was inclined to think the good effect of guaiacol was after all chiefly due to its astringency. Astringent applications often cause ejection of the occluding plugs, and this leads to a prompt cure.

Dr. T. Passmore Berens, of New York, presented in connection with this discussion a specimen of papilloma of the tonsil itself.

Price Brown, of Toronto, said that Lennox Brown, in his recently published book, declares that peritonsillitis is in the great majority of instances the result of true tonsillar inflammation. He thinks that peritonsillar abscesses nearly always occur as an extension from the tonsil, and second cases of tonsillar abscess occurring independently of rheumatism show additional enlargement of the tonsil after each attack, indicating in the latter that the inflammation is tonsillar and not peritonsillar.

Dr. M. D. Lederman reported a case which had presented symptoms like those of the grip, and the appearance of the throat had been that of a pseudomembranous inflammation. Under the microscope there were colonies of staphylococci. The pain had been very severe. Within two days after the subsidence of the membranous affection of the follicles all of the joints of the body had become involved, but relief had been quickly afforded by antirheumatic treatment. He had seen a case in which the tonsil had been incised seven times for a peritonsillitis. The knife had to be carried directly backward for an inch and a half before pus could be reached.

Dr. V. Freudenthal, of New York, agreed with Dr. Ward that it was impossible to prevent acute lacunar inflammation by the use of any drug, but it could be done by attention to the climatic factors which play an important rôle in the etiology of this affection. To prevent acute lacunar tonsillitis he does not advise bundling up children in clothes, but hardening them to changes of temperature. Mucus dropping down into the nasopharynx and drying acts as a foreign body and causes an irritation which predisposes to lacunar inflammation. The obvious indication is to treat the nasopharynx.

Dr. M. A. Goldstein, of St. Louis, suggested the possibility of there being but two avenues of infection. There are two forms of peritonsillar infection having separate clinical characteristics. The peritonsillar form is confined practically to the anterior pillar; the other is a supratonsillar abscess. He raised the question if it were not possible for a form of peritonsillar abscess which is so closely associated with the tonsil, and so adjacent to the anterior pillar to be a direct tonsillar infection, and the other an infection carried by the lymph channels. He believes it possible to differentiate these two forms. He agreed with Dr. Freudenthal as to the preventive measures indicated for acute tonsillitis. He has attempted in the last few years to thoroughly curette the lacunæ free from all detritus, and then apply to the lacunæ pure carbolic acid, pure guaiacol or trichloracetic acid. In most of the cases in which this has been done the duration of the tonsillar affection had been materially reduced.

Dr. T. H. Halstead, of Syracuse, had just seen an interesting case of tonsillar inflammation. A university student had been sick with a fever like that of typhoid. About the ninth day spots had appeared on the body, and a spot or two of ulceration on the tonsil. The throat symptoms had then rapidly become the more prominent. Another physician insisted that the case was syphilitic. When the speaker had seen the case two or three days later, the uvula was enormously edematous and the left tonsil ulcerated. The temperature ranged between 100° F. in the morning to 102° F. at night. The case seemed to him to be one of typhoid fever complicated with a tonsilar inflammation, but he had never seen this complication before.

Multiple Cerebellar Abscess; Sigmoid Sinus Thrombosis.—J. E. Sheppard, of Brooklyn, presented a cerebellum and dura showing a multiple cerebellar abscess and a sinus thrombosis. The specimen had been taken from a man thirty-seven years of age, admitted to the Brooklyn Hospital on April 19, 1901. About four months previously he was hit in the frontal region with a pitchfork. One month later he began to have pain in the right ear, and shortly afterward a discharge of pus from this ear. For about one month he had had headache, especially on the right side, and, according to the patient, he had had a swelling back of the ear. Examination showed hearing to be impaired; there was a moderate increase in the number of white blood cells; the temperature under the tongue was between 97° and 98° F., and in the rectum 99° F.; the pulse ranged from 58 to 72. At the operation the mastoid cells were found obliterated. On probing the sinus there was an escape of about half a drachm of pus containing streptococci. There had not been a single symptom of sinus disease. Three days later a trocar and canula had been plunged into the cerebellum and had withdrawn two or three drachms of pus containing streptococci. This had resulted in temporary improvement. Two days afterward the patient died suddenly of respiratory failure. In the anterior part of the right half of the cere-

bellum were two abscesses, the anterior one having been opened. The right lateral sinus was entirely, and longitudinal sinus partly, obliterated by contained organized blood clot.

PAPER:

A YEAR'S EXPERIENCE IN THE TREATMENT OF THE EUSTACHIAN TUBE BY MEANS OF THE ELECTRO-BOUGIE.

THOMAS J. HARRIS, M.D.

No contribution in recent years to the treatment of catarrhal disease of the middle ear has excited greater interest and offered more promise of success than that proposed by Duel in a paper read before this society in Cincinnati in 1899, entitled "The Value of Electrolytic Dilatation of the Eustachian Tubes in Chronic Tubal Catarrh and Chronic Catarrhal Otitis Media." Since this original paper by Duel, many aurists in different parts of the country have been testing the value of electrolysis, and papers have appeared by Kenefick, Brandegee, and others. Any method of true merit welcomes the fullest investigation. With an idea of further testing the value of this method, the writer has devoted most of his time in the ear department of the Manhattan Eye and Ear Hospital for the past year to the application of electrolysis to suitable cases. The subject has been approached without bias and in an entirely impartial spirit. This work was rendered possible by, and at the suggestion of, Dr. Wendell C. Phillips, who afforded every courtesy and opportunity for making these investigations in his clinic. Out of over 75 cases referred, some 33 were regarded as suitable. These, with the two exceptions to be noted, all showed the presence of stricture in one or both tubes. Each case was carefully tested with acoumeter and tuning fork at the beginning of treatment: many had previously received a full course of treatment by means of the catheter. So far as possible the technique as practised by Duel was followed out. A Wappler machine was employed in connection with the street current. In a majority of the cases a silver catheter wound with thin rubber was used; later on, a hard rubber catheter was substituted. Care to sterilize all instruments was continually exercised. A current of not more than three milliampéres was the rule—in every in-

stance, the sign of "bubbling in the ear" was sought for—and no increase in the strength of the current was made after that point was reached. As little force as possible in advancing the bougie was employed. Inflation after bougeing was always avoided. The negative current was employed for a period not exceeding five minutes. In each instance, with the exceptions to be noted, the bougie was caused to enter the tympanum. The bougies were the graded gold bougies made by Ford.

Among the questions sought to be answered were:

(*a*) The value of electrolysis as compared with other methods of treatment in the relief of tinnitus due to middle-ear catarrh.

(*b*) Its relative value in improving the hearing.

(*c*) How permanently the structure is relieved.

(*d*) What dangers, if any, lie in its use.

(*e*) What is the true nature of the process or phenomenon taking place.

In the 33 cases treated, 26 had tinnitus of a chronic nature (no acute cases). Of these 26

1	was cured,
13	were improved,
12	were not improved.
26	

Seventeen of the 33 complained only of hard hearing. Of these

12	were improved,
5	were not improved.
17	

That is to say, as regards tinnitus 55 per cent. were cured or relieved, and as regards hearing 72 per cent. This can be compared with Duel's results of 42 cases of tinnitus, where 38, or 90 per cent., were relieved in whole or in part. An analysis of the 13 cases of tinnitus reported above as improved is in order, inasmuch as improvement may be much or little, temporary or permanent:

Case 1.—After three months of treatment, reports tinnitus lessened in degree, but still persisting. No previous treatment.

Case 2.—Three months under treatment. Much relief to tinnitus, which at times ceases. Much previous treatment.

Cases 3, 9 and 10.—Some improvement.

Case 4.—Three treatments; no decided improvement, but patient was relieved.

Case 5.—Relief to tinnitus, but it was not permanent; stricture dissolved.

Case 6.—Decided benefit. No other treatment availed; but no stricture present.

Case 7.—Considerable improvement, but stricture never passed. Three months of weekly treatments.

Case 8.—Tinnitus lessened, but persisting; character changed.

Case 11.—Tinnitus lessened, but persisting; character changed.

Case 12.—Immediate and marked improvement. No previous use of celluloid bougie.

Case 13.—Two treatments only. A slight improvement followed, but the patient disappeared from observation.

In brief, of these 13 cases reported as improved,

2 were much relieved,

9 were partially relieved,

1 was much relieved, but no stricture was present,

1 was only temporarily relieved.

Of the two cases reported as cured, one disappeared after the second treatment, and no subsequent report could be obtained from either until recently, when the second patient returned at the end of four months and reported the tinnitis as bad as ever.

We can then with certainty point to only 2 cases out of 25, where strictures were present, in which permanent and marked relief to the tinnitus was experienced.

A further analysis of the 12 cases where there was no improvement shows that all were classed as mixed or sclerotic (combined involvement of middle and internal ear).

Strictures were encountered in every instance and successfully passed, except in two cases. In one case electrolysis caused an increase of the tinnitus.

A similar study of the 12 cases where improvement in the hearing was noted, reveals three in which the improvement was only slight—about three inches; in 3, the gain was from six inches to three feet for the whispered voice; while in the remaining 6 the improvement was noteworthy—four feet to twelve feet. In short, real benefit to hearing was made in 8 of the 17 cases, or in a little less than half. Later examination of two cases shows all improvement lost.

Two patients who complained only of a sense of fulness in the ears—one of them after much previous treatment by the catheter—were signally relieved. One case of persistent non-inflammatory pain in ear, resisting all other treatment, was much benefited.

An important question is how permanently the strictures are relieved. Here my experience is at variance with Duel's. In many instances, after thoroughly opening the tube and passing the stricture into the tympanum, at our next electrical treatment, although the ears had been carefully inflated in the mean time, a reforming of the obstruction was met with. This was particularly true in Case 7, where, after two months' absence, the work had to be done over again. This patient never made the same improvement after the second course of treatment, gaining at first fifteen feet, and later only from four to six feet. We are convinced, too, that the electric current is capable, even when properly used and within moderate limits of strengths, of causing adhesions in the tube. One instance of this was particularly well demonstrated. It was the case previously referred to as presenting catarrhal pain in the ear. Several strictures were encountered and passed, with much relief to pain. The "bubbling" symptom was met with only at current strengths of from 4 to 5 milliampères. At an interval of a month, electrolysis was again tried, but all attempts to introduce the bougie failed. It was an unusually favorable case to see that the catheter was in the right position, for there was a marked cleft palate admitting of direct inspection, and revealing adhesions directly at the pharyngeal mouth.

In this connection it may be said that, in our experience, bubbling is not always a reliable sign. In many instances it will be noticed by the patient at 1, 2, or 3 milliampères. In other cases 5, 6, or 7 milliampères have to be reached. Several times the patients reported a similar bubbling after removal of the bougie, and in at least three cases no bubbling was ever secured; only increased tinnitus or pain, such pain always evidencing the cautery effect of the current. Care was exercised in each case to secure as thorough asepsis as possible. In spite of this, suppuration of the ear followed in four cases. In three of these cases the recovery was rapid, ten days to two weeks, and was unattended by any unpleasant sequelæ, not even reducing the hearing for a long time. The fourth case deserves to be reported at greater length.

The patient was a young lady, twenty years of age, who presented herself for hard hearing. An operation for adenoids and septal exostosis was performed. This was followed by an attack of grippe, confining her to bed. This seemed to be a relapse from a previous attack just before she entered the hospital, not

known about at that time. Upon what appeared full recovery, electrolysis was applied to the tube opposite to the side of the nasal operation. A slight stricture was encountered and passed at 1 $^{7}/_{16}$ inches. Improvement in hearing was noted, with no unpleasant results. The following week the bougie was again introduced. This time no stricture was met, but at exactly 1½ inches, as was carefully ascertained after removal, a distinct snap was heard both by the patient and myself, followed by severe pain. Examination showed that Shrapnell's membrane was much reddened. The pain disappeared for three hours, then returned with much severity. I saw the case on the day following or at the end of twenty-four hours, found a bulging drum, and performed a paracentesis. Examination of the discharge showed many streptococci. No pain over mastoid. The day following, pain developed in the mastoid and five days from the electrical treatment I opened the mastoid, and found pus. The recovery was uneventful and no permanent loss of hearing was sustained.

Here, clearly, there was a short Eustachian tube. One and a half inches meant a forcible tenotomy of the tensor tympani or possibly a luxation at the incostapedial joint. It is questionable if even this could cause all the disturbance which followed without the presence of bacteria. These could have been introduced by means of the catheter or bougie, in spite of the care which was exercised. As these had been properly sterilized it is possible that bacteria were already present in the ear as a result of the grippe, and that the traumatism served thus as an exciting factor. This case is full of significance. We feel that it is time to sound a warning note against the widespread use of the method on the ground of its entire freedom from danger. Recently we have heard of still another complication. In two cases, in the hands of an experienced, competent man, the bougie has broken off *in situ*.

We may conclude:

1. That the assumption that the length of the Eustachian tube is 1½ inch in all cases, is an unsafe rule to follow, and that, beyond 1¼ inch, the greatest care is to be exercised as to its further introduction. We are told that we learn when we have entered the tympanum by the touch gained by experience, but this experience may be gained at too great a cost.

2. That too scrupulous care in the way of antisepsis cannot be exercised. The experience of Duel was that force in advancing the bougie was not necessary; this has not coincided with ours.

In many cases, it is true that mere contact of bougie caused a dissolving of the stricture. In others a considerable amount of pressure needed to be employed. To know just how much force to use in a given case is often a delicate matter. The liability to cause a false passage is constantly to be borne in mind. This has actually occurred in the experience of several of my confrères. In two cases it was impossible after repeated efforts—and using as much current and force as seemed warranted—to pass the obstruction. It gave the sensation of a wall of bone.

The nature of the process is full of interest. In our mind there seems considerable question whether it is truly an electrolytic process. It seems scarcely possible to believe that a fibrous mass of years' duration can be dissolved in thirty seconds, as is often the time in which a stricture gives way, by a two milliampère current exerting its influence, not merely on the end of the bougie, but also over its sides. It is not an infrequent experience to find that a stricture which had been originally passed could not be passed at the second sitting, but at the third sitting no difficulty in passing it was encountered.

Following the suggestion made by Dr. J. F. McKernon at a recent meeting of the Section in Otology of the New York Academy of Medicine, several cases of dilated tubes were subjected to the treatment. In one case only was there decided benefit to tinnitus and hearing. Here, a reflex action on the auditory nerve was probable.

A still weightier question is the true nature of the obstruction we meet with, which we commonly designate a stricture. Does there really exist in most cases a true fibrous deposit, causing narrowing or actual obstruction? Repeatedly we could succeed in getting good inflation sound when the bougie encountered an obstruction, and, as has just been stated, an obstruction present one day and impassable, was strangely manageable the next day.

Much emphasis is to be put on the necessity of following up our cases to get the true results. It will be recalled that several patients reported as cured or improved, returned at a later period without any improvement. It is a question whether some of the cases would not have shown improvement equally well without the electricity, using only the bougie.

Electrolysis, while a new procedure in the ear, has been used for years in the urethra. Dr. Robert Newman has been its most energetic supporter, asserting that it affords a certain and permanent cure to urethral stricture, if properly applied.

That his views are not held by all workers in that specialty is shown by the conclusion to an article on the subject by so distinguished a syphilographer as Dr. E. L. Keyes, who, after a careful study extending over several months, says:

"My study of the subject and the experience it has brought me, digested with all the impartiality I possess, lead me to state that the allegation that electricity, however employed, is able to remove organic urethral stricture radically, lacks the requirement of demonstration. The confidence of its advocates that it will *radically cure organic fibrous* stricture is, in my opinion, due either to the combined *credulity* of the patient and the *imagination* of the surgeon, or to some special but *fortuitous* act of Providence, upon the coöperation of which, in the case of his own patients, the general practitioner cannot with any confidence rely."

We feel warranted in drawing the following conclusions:

1. The electro-bougie has a place in our aural therapy—though a less important one than was at first supposed.

2. It should be used after, and not before, other methods of treatment.

3. It will be most liable to fail if any associated internal ear disease is present.

4. Its results are not always permanent—the stricture may reform—we may hope rather for a diminution than a disappearance of the tinnitus.

Two cases totally relieved out of 25.

Two cases partially relieved.

5. Its use is not without danger—and a proper knowledge of the anatomy of the parts and of the technique is essential.

6. It is a question whether the process is a true electrolytic one, or if in many instances the obstruction is a true fibrous stricture.

DISCUSSION.

Dr. George L. Richards, of Fall River, said that it was important not to inflate immediately after the use of the bougie. He did this once, and had been unfortunate enough to blow some air into the tissues around the Eustachian tube. As to the patient's sensations he could speak from personal experience. He had had the Eustachian tube catheterized before the days of cocain, and had also submitted to Eustachian electrolysis in the hands of Dr. J. A. Kenefick. The operation had not been painful, and after three or four minutes there was a sensation as though something gave way and air entered the tympanic cavity—a sensation which he had never experienced in the previous catheterizations.

Dr. Wendell C. Phillips, of New York, said that he had watched Dr. Harris's work in his clinic with great interest. His own experience with the method corresponded exactly with that described in the paper. He believes it is a useful method of treating strictures of the Eustachian tube, but it is not a cure-all, and he does not believe the electricity had any permanent effect on the strictures as applied in these cases. He was inclined to agree with a recent statement of Dr. Dench, that the results were just what one would expect to achieve by the use of any bougie, with or without electricity. There is, however, one slight advantage, *i. e.*, it was an easy mode of passing the stricture, because of the temporary relaxation caused by the electric current. The speaker said that some years ago he had suffered from very severe tinnitus in the right ear. At that time Dr. Dench had passed in an ordinary bougie with entire and permanent relief of the tinnitus. Tinnitus is certainly very much relieved by electrolysis of the Eustachian tube. As to the case of mastoid involvement reported in the paper, he believed the explanation of this complication was to be found in the supposition that they had not waited long enough after the attack of grip for the bacilli to disappear. There was some danger of these bougies breaking, as shown by this accident having occurred even in experienced hands.

Dr. N. L. Wilson said that his limited experience confirmed most of what had been said by Dr. Phillips. However, he had had one case in which he had been unable to introduce the ordinary bougie and yet the electric bougie had passed readily. Having passed the stricture with this instrument he was accustomed to use an ordinary bougie to complete the work. He also had experienced the introduction of the electric bougie, and had found it quite painful.

Dr. B. B. McAuliffe, of New York, stated that the action is not truly electrolytic but a tonic one on the muscular and vascular portions of the tube, that the difference in the amount of bubbling depends on the amount of moisture present in the tube: that it is not practicable to melt a stricture without substituting another scar surface. He asked if the electrolytic action had ever been done under sight, on the surface of the body.

Dr. W. P. Brandegee, of New York, said that this method has proved to be thoroughly practical. In cases at the New York Eye and Ear Infirmary he has noticed a distinct and permanent result in nearly every case. The cases had gone round to various clinics complaining of tinnitus and deafness, and had not received benefit until subjected to this treatment. They had not stopped to theorize, but they did know that the tinnitus had been greatly diminished and the hearing markedly increased. The tactile sensation conveyed to the operator in the passage of the electric bougie shuld be sufficient to warn him when he has reached the tympanum. Often the stricture is not met with until one reaches the mouth of the tympanic cavity. In the last two or three years

they have used the bougie in over 150 cases, and in not a single one has there been suppuration. The instruments are all carefully boiled. He was not aware that he had ever made a false passage, and thought there was much more danger of such an occurrence with the ordinary bougie because of the force used.

Dr. C. Dunbar Roy, of Atlanta, said that for the past thirteen months he has been using electrolysis of the Eustachian tube, and has been impressed with the part played by the personal equation. In the first few months he had rather poor results; in the last four months the results have been far better. He believes the Eustachian bougie is most useful in selected cases of tinnitus and deafness. He has employed it entirely in private practice, and has obtained far better results than by any other method. He used the chloride of silver battery and five milliampères of current. He never uses anything but a solid silver catheter that he can bend to fit the nasopharynx and make enter the tube. With a hard rubber catheter he never felt sure of the direction and location of the instrument. In some cases he had obtained excellent results with a whalebone bougie, but when this failed he resorted to the electric bougie. The amount of pain attendant upon the treatment varied considerably in different individuals. He never observed any infection or any irritation of the drum. In his ten cases the results have been most satisfactory.

Dr. D. S. Dougherty, of New York, spoke by invitation. Some years ago he had been deeply interested in the relief of urethral stricture by electrolysis. At that time he had collated about 200 cases. The permanent cures amounted to 12 per cent., and in these he believed the good result was not from electrolysis but from the bougie, just as from an ordinary bougie. In cases in which stricture was temporarily impassable he always succeeded in passing the electric bougie.

Dr. J. A. Kenefick, of New York, said that the condition of the tube could be determined in most cases by the use of the otoscope under inflation. When the obstruction was situated near the tympanic orifice one was apt to be misled by the sound striking this obstruction instead of the drum. He would like to ask Dr. Harris whether in the case in which an adhesion was afterwards found at the mouth of the tube the catheter used was metallic. If the tip of the metallic catheter were not properly insulated, some action was likely to take place at the entrance to the tube. At the tympanic cavity considerable obstruction might be met with until the current was turned on. In an experience of nearly three years with over 100 cases he never had suppuration or any other untoward result. The sensation of freedom imparted to the bougie indicated to him when the bougie had entered the tympanic cavity. Again, the facial expression of the patient changes the moment the bougie enters this cavity, this region being much more sensitive than the tube. In some cases it was necessary to employ the treatment two or three times before overcoming the obstruction.

Dr. Arthur B. Duell, of New York, said that a paper like the one under discussion must always prove useful because of the careful and faithful analysis of the cases presented. He never advocated this mode of treatment as a cure-all. In every case of catarrhal otitis media at some stage the Eustachian tube would become obstructed, and there would result tinnitus, deafness, and perhaps also vertigo. The one thing to be accomplished in such cases is the ventilation of the tympanum by the opening of the Eustachian tube. Although Dr. Harris's one year's experience had led him to speak of the method in a somewhat detrimental way, it should be remembered that other speakers had given a much more favorable report on the method, founded upon an experience of from three to five years. A permanent opening of the Eustachian tube could be accomplished much more quickly by this method than by any other. It is not a mechanical effect, as is the case with ordinary bougies.

Dr. E. B. Dench said that if electrolysis of the Eustachian tube had accomplished nothing more than elicit this discussion it had certainly done a good deal for otology. He agreed pretty well with Dr. Harris in what he had said. He believes the method perfectly safe if practiced according to the principles of aseptic surgery. He has used the ordinary bougie in grip cases, and has had suppuration. The choice of the instrument must vary with the individual operator. When he could not get the ordinary instrument through he would use the electrolytic method; until then he perhaps would try it. He has had these obstructions recur after the use of the simple bougie and has seen cases recur after the prolonged use of the electric bougie. A very slight difference in the curve given to the bougie would explain the varying difficulty experienced on different days in passing the instrument. Air might get through, and yet the instrument would not take the abrupt turn. Again, on certain days the mucous membrane of the tube would be more swollen than on others, and that too in certain portions of the tube. Mention was made of a case of partial occlusion of the external auditory meatus, in which dilatation by electrolysis had been tried after division with a knife. Although the conditions seemed favorable, and the operation could be actually witnessed, electrolysis had accomplished nothing.

Dr. N. H. Pierce, of Chicago, called attention to the fact that the mucous membrane lining the Eustachian tube is not smooth but is in folds, and that there may also be more or less obstruction from adenoid tissue. Strictures occur most frequently at the isthmus. In the future work in this field it is most important to make a careful diagnosis. In stapes ankylosis, or in various conditions of the middle ear, electrolysis of the Eustachian tube could not do good.

Dr. T. P. Berens said that in unskilled hands electrolysis of the Eustachian tube was a dangerous and formidable procedure. The cases most benefited by it had been those strictures in a small part of the tube only.

Dr. HARRIS, in closing the discussion, said that he believed the metal bougie was used in the case in which adhesion was found at the mouth of the tube. In every case a celluloid bougie had been passed before trying electrolysis. In the hands of competent persons, thoroughly acquainted with the technique, the method was probably free from danger, but under other circumstances it certainly was not free from risk.

PAPER:

CHRONIC NASOPHARYNGEAL BURSITIS. (THORNWALDT'S DISEASE.)

BY DUNBAR ROY, A.B., M.D.

A bursa is defined in Foster's Encyclopedic Dictionary to be "a pouch, especially a synovial sac." Bursæ, as is well known, exist in various portions of the body, especially under the tendons of muscles around the various joints. The presence of these can sometimes be traced and their etiology determined. There are other bursæ, however, which are congenital, although some of these can occasionally be traced to an arrested development. Among these latter is the *bursa pharyngea* which occurs in the vault of the pharynx exactly in the median line. Adenoid tissue can be found in the nasopharyngeal space of nearly every individual, varying of course both in the amount and the location. In children we believe that adenoid tissue is universally present, and this statement is made by one who practices in a southern climate. I am firmly convinced that the climate does not produce adenoids, but that it influences its growth and morbid state must be apparent to all. My experience shows that these growths occur in the black as well as in the white race notwithstanding that some southern rhinologists affirm that they never occur among the negro. We believe that it is just as natural for adenoids to be present in children as faucial tonsils, and like the latter there are great variations in size. It is not necessary to remove all faucial tonsils nor is it necessary to operate on every case of adenoids, and yet we think it is a good deal better to scrape too often the nasopharynx in children than not to scrape often enough. Harm is never done by the quick use of Gottstein's curette, but great harm frequently follows its non-use.

As individuals grow older this collection of adenoid tissue in

the vault gradually becomes smaller, depending in a great measure upon the presence of that innate tendency toward a catarrhal condition.

The larger the amount of adenoid tissue present in childhood, the slower is its disappearance, which, of course, never disappears entirely, but is merely transformed. If the patient has been afflicted with a large amount of adenoid tissue in childhood and this was not removed surgically at that period, experience teaches me that such will have trouble in the nasopharynx nearly all of his or her life. This same gelatinous polypoid tissue in childhood will become firmer and more fibrous as the individual grows older, and instead of its being globular or cushion-like, there will be formed bands of fibrous tissue running in the long axis of the pharynx. Between these bands secretion will lodge which will be exceedingly difficult of removal.

Crypts, which normally exist in adenoid tissue, counterparts of the crypts in the faucial tonsils, exist even after all the adenoids have seemingly disappeared and such always affords a nidus for constant irritation and for the production of acute follicular nasopharyngitis. I have rarely failed to find the remnants of some adenoid tissue in every patient who complained of nasopharyngeal catarrh. Rhinologists owe much to Luschka, who was the first to describe so minutely the anatomy of the nasopharynx. Anatatomists generally agree that there are two kinds of glands in that region: (1) The conglomerate, occurring especially round the mouths of the Eustachian tube and on the posterior surface of the soft palate, and (2) the follicular glands which are more especially bunched together just at the center of the vault and commonly known as Luschka's tonsil. This third tonsil varies considerably in size and formation, being sometimes round or oval and then again linear with distinct crevices between the bands. "At the lower portion of the pharyngeal tonsil, in the median line, a small opening is sometimes present which leads into a sac about three-fourths of an inch long and one-fourth of an inch wide, known as the pharyngeal bursa, the name being given to it by Luschka from a term already used by Meyer in description of pharynges of certain mammalia. The anterior wall of the bursal sac is covered with glandular tissue, while the posterior wall is joined by a ligament to the basilar process of the occipital bone. Some observers deny the existence of this sac as a distinct anatomic structure, holding that this bursa is simply a median fissure of a normal pharyngeal tonsil, the fissure being the result of adhesions to the superficial

layers of the glandular tissue" (Burnett's System). These fissures in Luschka's tonsil vary considerably in different individuals and their presence to any large extent is due in my opinion to its having been a neglected case of adenoids in childhood.

Whether or no the pharyngeal bursa exists, is still a mooted question, and after the examination of the nasopharyngeal space in several cadavers, I was unable to discover a distinct pouch. This, however, does not invalidate the fact of its existence. In many of those cases where there were decided objective symptoms of nasopharyngeal catarrh, I have been able to find almost universally the presence of this opening in the vault entirely different in appearance from the slit-like processes so frequently found in Luschka's tonsil.

In 1885, Thornwaldt, of Danzig, published an extensive article in which he describes still more minutely than Luschka had done in 1868, the pharyngeal bursa. The main object of his paper was to show that the large majority of nasopharyngeal catarrhs were due to the presence and diseased condition of this bursa pharyngea. Since that time such a pathologic condition has been spoken of as Thornwaldt's disease.

There is a great diversity of opinion among anatomic investigators as to whether such a bursa exists. In 1878, Ganghofer, after much anatomic investigation, published an extended article in which he denied the existence of the bursa pharyngea in the form described by Luschka, but described it himself "as a simple, more or less marked depression of the mucous membrane, having no great depth, and not connected with the basilar process, as claimed by Luschka, by means of a strip of cellular tissue."

In 1887, Schwabach, of Berlin, published his investigations on this subject, these having been made on cadavers to determine the true character of the pharyngeal bursa. He examined 100 adult heads, twenty-eight children's and two fetal heads. From his examination he found the same condition as described previously by Ganghofer and that was "a series of deep, irregular and shallow clefts, forming ridges of various heights and breadths, which gradually disappear as age advances." This depression is well shown in the accompanying plate. In ten of the twenty-three preparations examined, Schwabach found more or less defined evidences of the original clefts in ten, and in these the middle cleft was the one partially or completely retained, while a few showed a number of openings of varying size. He concludes, therefore, "that the bursa of Thornwaldt is but the remnant of the middle

cleft, the 'purst' or blind pouch being the posterior end, formed by the partial agglutination of the margin, and that it is but an intergral portion of the pharyngeal tonsil, taking part in the diseases to which the latter is subject, but not possessing a pathological character of its own."

Very pertinent to these latter statements are those of Trautmann, "that various authors relying solely upon rhinoscopic examinations, had arrived at erroneous conclusions when studying the hyperplasia of adenoid vegetations.

We see that there is as yet much diversity of opinion as to the part played by the bursa in the production of post-nasal catarrh. With Schwabach are associated Ganghofer, Trautmann and others, while some close clinical observers, such as Thornwaldt, Massucci and Gradle, have found that their investigations warrant them in attaching much importance to the presence of this bursa pharyngea. In my own mind I am firmly convinced that certain cases of naso-pharyngeal catarrh are dependent upon some pathological condition of this bursa, for they all surround themselves with certain unique objective symptoms, distinctively characteristic.

Within the last three years I have had two cases whose clinical pictures were almost identical in character and which showed a condition of the nasopharynx peculiar to themselves. These will be briefly narrated:

Mr. L., lawyer, age 27, consulted me on account of an harassing scabby accumulation in his nasopharynx. He gave the folloiwng history: Had never had a spell of sickness in his life, nor was he susceptible to colds. Health almost perfect except for this post-nasal accumulation. Was of a nervous temperament. Had no discharge from the nasal cavities, but behind these there was a constant burning sensation. About once every second day, in trying to clear the post-nasal space, he would cough out a scab the size of a ten cent piece, dry on one side and moist on the other where it had been attached. It always came from the same spot, always had the same formation, and he was always conscious of its presence. The patient had an excellent throat to examine, having such control over his soft palate that I could use simultaneously both the mirror and the cotton probe. This gave me an excellent opportunity to apply the treatment. I found a post-nasal scab situated at the vault of the nasopharynx, just in the center and little below the nasal septum. No secretion could be seen anywhere else. This scab was removed with a piece of cotton on

the end of a curved applicator, and from its point of removal was seen a depression into which the end of my little finger would probably fit, at the center of which was found a minute opening.

This opening was entirely different from the slits found when they proceeded from remnants of adenoid tissue left, for in this case they showed a space everywhere free from glandular deposit. Nowhere was there any accumulation in Rosemüller's fossa, and the nasal cavities appeared perfectly normal. This case, to my mind, differed from the ordinary post-nasal catarrh, being entirely free from the objective symptoms usually found in that condition. My own diagnosis was that of chronic inflammation of the pharyngeal bursa. The prognosis in these cases as to absolute cure is exceedingly unfavorable, and I was fully aware that I had a hard case to deal with.

The treatment consisted in daily cleansing of the post-nasal space with equal parts of peroxide of hydrogen and water. This the patient accomplished himself with a post-nasal atomizer. This was easily done because of the great tolerance to instrumental manipulation in this region I myself used all the well-known remedies, such as varying solutions of nitrate of silver, iodin and iodid of potash solutions, ichthyol, chromic acid, and finally the electro-cautery. Curetting was not resorted to, because there was no indication for this procedure. The patient improved some, but his condition was never cured, and he finally passed from under observation.

Case II. This was one quite similar to the first.

Mrs. L., age 33, consulted me for symptoms which annoyed her similar to the one above. This lady was quite a vocalist, having a beautiful contralto voice. She complained of an intense burning pain behind the nose and the presence of secretions in the same region which usually came away after thorough douching in the morning. This condition she said had been present for two years, but she was able to dislodge the secretions after large amounts of warm salt water had been passed through the nose. The secretion always came away in the form of a distinct scab. Her general health was excellent, which was well exemplified in her physique. On examination the nasal cavities appeared normal, as also the oropharynx and larynx. This patient also had excellent control of her throat for examination and instrumental manipulation. The only pathologic condition seen was a depression in the median line of the vault just back of the septum, in which was seen some dirty yellowish secretion. This was re-

moved with a cotton applicator, revealing a raw, bleeding surface. An opening, similar to the one seen in the first case, was found at the lower end of this depression into which the probe could be passed. This patient was treated with various remedies with varying success. She is still under treatment.

Since this time I have had three other cases.

This paper is more for the purpose of eliciting a discussion than the advancing of any new ideas, and I trust that the fellows of this society will give us the benefit of their own clinical experience with such cases. These two cases which have been reported, present an entirely new type of post-nasal trouble, different from the ordinary post-nasal catarrh where adenoids are present or where there is a distinct nasal lesion.

From objective symptoms present, these two cases offer all the features of that pathologic condition described by Thornwaldt, and every clinical feature of the case points to a diseased state of the pharyngeal bursa. Those who deny the existence of this pathologic condition as a distinct entity, I am sure base their opinions on an anatomic investigation, and not on clinical facts. Such cases when once seen, are readily recognized because of the great similarity in both their objective and subjective symptoms. The presence of this central depression, the opening at the lower portion from which in one case mucoid matter exuded, the irritated condition of this socket, the presence of a firmly imbedded scab, these are symptoms distinctly characteristic of this peculiar condition.

Whether the so-called bursa pharyngea is a distinct bursa or blind pouch in the mucous membrane, it is certainly the cause of a peculiar form of naso-pharyngeal catarrh. My own idea is that this bursa or pouch is but rarely present normally, but when it is, especially if there be any naso-pharyngeal irritation present, and also if there be remnants of old adenoid tissue, it is apt to take on a catarrhal condition and produce those symptoms as were described in the two cases above.

I do not agree entirely with Delavan, who said in a paper read in 1894, that "the so-called Thornwaldt's disease appears to be nothing more than neglected adenoid hypertrophy."

There must be something more present besides neglected adenoid hypertrophy to produce this pathologic condition, for too many neglected cases have been seen where none of these symptoms were present. Nor do I agree with Hajek, of Vienna, who believes "that Thornwaldt's theory as regards the recessus medius

should be set aside, since the identical trouble described by him as limited to that crypt, could also be observed in other recesses of the naso-pharynx." This is no theory, but a clinical fact, as can be demonstrated on any typical case. Nor can you find similar conditions in other recesses of the nasopharynx as the author holds, for this median recess has a pathologic formation *sui generis.*

We have all seen these recesses in old cases of neglected adenoids, but the appearance of such even when there is much catarrhal trouble, is entirely different from the present condition under discussion.

In looking up the literature on the subject, there was found a pretty evenly divided opinion among competent observers as to the non-existence of this peculiar pathologic condition, and yet I think this is largely due to the fact that the condition itself is not frequent and probably many observers did not recognize it as a distinct entity.

I cannot agree with Thornwaldt in attributing every case of post-nasal catarrh to this condition.

It was the non-success of the treatment in the two cases reported which caused me to study more minutely their clinical features. To treat the post-nasal space successfully you must be able to inspect its surface thoroughly and be able to make your applications just to the points desired. This is not always easy unless it is in a patient who has perfect control of his soft palate. I think that the method in vogue of mopping the nasopharynx without seeing the point for which the application is intended, is both painful to the patient and unscientific in its purpose. If the patient has not enough control of the muscles of the throat to allow the applicator and post-nasal mirror to be used at the same time, then the palate retractor should be brought into requisition and the parts treated properly.

I could never agree with Ziem, of Danzig, who advocates "the routine employment of palpation of the nasopharynx as superior in every way to posterior rhinoscopy." I believe that the reason non-success so frequently results in the treatment of nasopharyngeal troubles, is because this region is not examined thoroughly enough.

The best treatment which I found in addition to the thorough cleaning which the patient accomplished at home, was an application of a solution of nitrate of silver, 60 grs. to the ounce, directly to the sulcus, followed by thorough spraying of the nasopha-

rynx with *hot melted* vaselin and orthoform. The curette and electro-cautery point were tried. Thornwaldt recommends the destruction of the bursa by means of these latter methods. My own success was not at all gratifying. Schmiegelow of Copenhagen, has reported three cases of obstinate post-nasal catarrh cured by cauterizing the bursa. Such success however has not been obtained by many other observers and in fact a majority report a rather small proportion of cures.

The prognosis as to ultimate cure in these distinctly characteristic cases is certainly not brilliant, and the laryngologist will be taxed to his utmost to place the patient in even a comfortable condition.

DISCUSSION.

Dr. C. G. Coakley, of New York, said he had seen cases similar to those reported in the paper, and he has always regarded them as the result of a peculiar arrangement of the lymphoid tissue in the nasopharynx. The formation of deep recesses is undoubted, and some of them extend down even to the periosteum of the bone. In the cases under discussion he thought that there was a deep recess passing under a band of connective tissue. He has curetted such a case with temporary benefit only. The relapse was found to be caused by a retention of secretion, and on the thorough removal of the secretion from the blind pouch, the parts healed permanently. The curette passes over the pouch without removing this material.

PAPER:

DISEASES OF STENSON'S DUCT AND THE TREATMENT.

CARL E. MUNGER, M.D.

The excretory duct of the parotid gland is composed of small[1] branches originating in the gland itself and uniting in one common trunk, passing over the masseter and through the buccinator muscles, opens into the buccal cavity on the inside of the cheek opposite the second molar. The walls are dense and consist of an outer fibrous coat with contractile fibres and an inner mucous coat lined with columnar epithelium. Upon the integrity of this duct is dependent the normal flow of the parotid saliva, which forms such a large proportion of the glandular secretion which is important in buccal digestion. Whenever there is a closure, partial or complete, of these ducts, that becomes permanent, the resulting changes in the parotids themselves must be disastrous to function and structure. The diseases of this duct are either primary or secondary, and are temporary or permanent.

The primary diseases of Stenson's duct are:

(a) Inflammation, acute or chronic.

(b) Formation in the duct of calculi.

(c) Injuries to duct.

The secondary diseases are:

(a) Occlusions of duct following acute inflammation.

(b) Following excessive salivation.

(c) Impaction of calculi.

(d) Stricture due to healing of wounds.

(e) Ulceration of duct or abscesses in duct due to impacted calculi.

(f) Stenosis and ulceration due to impaction of foreign bodies.

(g) Cystic dilatation due to simple inflammation or cicatricial obstruction and suppuration.—"Amer. Text-Book of Surgery," p. 635.

(h) Fistulæ.

An acute inflammation of Stenson's duct, which is strictly

primary, can be due only to exposure to cold or extension by continuity of an existing inflammatory condition in the mouth. A marked case came under my observation September 25, 1899.

Mrs. S. G. woke up on the 20th of June after exposure to cold and wet the day before on board an ocean steamer, and found she could not open her mouth wide, and had a swelling in front of the right ear, and in addition presented the symptoms of an acute cold; her eyes were swollen and her throat was sore. She said that at the time of her first visit to my office that it seemed as if her head and throat were all filled up. She also complained of a feeling of fullness in the right ear, and stated that her mouth was apt to be dry. Examination showed that the ear was normal. There was a large, hard swelling of the right parotid gland, with no especial tenderness. There was also a hard cord-like feeling along the course of Steno's duct. The duct would admit only a small probe and for only a short distance at first, but repeated trials finally were successful so that the small probe could be introduced the whole length of the duct, and gradually probes of increasing size were passed until the duct was thoroughly and permanently dilated, with the result that the flow of parotid saliva was normally established and the gland itself practically reduced to its proper size.

The Formation of Calculi in the Duct Itself probably occurs only where the[2] lining of the duct has been roughened or thickened or a partial or complete stenosis has resulted with an accompanying decomposition of the parotid saliva.

Injuries to Stenson's Duct may be due to the traumatism of operations, or to injuries occurring in this region resulting in laceration or cutting of the duct, and the duct may also merely be contused or there may be a[3] subcutaneous laceration with no opening externally upon the face or internally within the cheek, in which case there will result a swelling of the cheek due to infiltration of saliva into the cellular tissue.

Occlusions of Stenson's duct occur as a result of adhesions following[4] acute inflammations or violent salivation, or after scarlet fever or diphtheria or gangrene of cheek, or may occur in the course of low fevers.

The healing of wounds of the cheek may result in stricture of the duct, either partial or complete, and if partial, may become temporarily complete from external influences, such as cold, etc. There may be a stenosis as the result of an ulceration or abscess due to impacted calculus, and there may be a stenosis due to the

impaction of foreign bodies other than salivary calculus, such as[5] hair in the duct,[6] fish bone, bristle from tooth brush,[7] small bearded tail of a chestnut, etc.

Salivary fistulæ, more especially those due to changes in Stenson's duct, have received much attention in the past and much ingenuity has been displayed in repairing the ravages which have occurred from stoppages in the duct. These fistulous openings may take place from any part of the duct or may occur directly from the parotid itself, or the external opening may be at a considerable distance from the parotid, to burrowing of the parotid saliva in the cheek wall. These fistulæ may open externally or internally, but as is the case with fistulæ in other parts of the body the openings are much more frequently to be found on the external surface. There may be one or more fistulous openings, the multiple openings being more often the rule, when the fistula is from the parotid itself.

The diagnosis of a parotid fistula, or fistula of the duct, is frequently simple, and when it is obscure a test of the escaping fluid will determine whether or not it is salivary in character. One test is that given by Robert's tincture chloride of iron, mixed on a white surface with the suspected fluid, will give a pink reaction with the sulphocyanide of K present if saliva is mixed with the discharge. Another is utilizing the power of the saliva to convert starch into sugar, and detecting it with Fehling's solution, and also by the disappearance of the starch and the inability to detect it with the iodine test.

The Treatment of these Cases of Stenosis will depend upon the character and cause of the trouble and the resulting after-effects. When the stricture is due to acute inflammation, gentle probing of the duct will relieve the damming up of the parotid saliva and in a short time the duct will remain permanently patent.

When the stenosis is due to formation of a calculus or calculi in any part of it, the method of procedure must depend upon the position, size and consistency of the stone. Probing and manipulation may be sufficient if the calculus is small, and especially when it is near the buccal orifice. If it is large or hard, or is surrounded by inflammatory adhesions, or there has been an ulceration through the wall of the duct, then excision must be resorted to and, of course, the operation should be an internal one to prevent an external fistula. If the calculus is near the gland itself an external operation may be necessary.

Injuries to the Duct, whether due to accidental traumatism

or occurring in the course of operations in this region, should be attended to at once to prevent that lamentable condition, salivary fistula.

Occlusions of the duct may be due to more than one stricture, in which case much time and patience will be exhausted before these can be sufficiently and permanently dilated. These dilatations may be accomplished by the use of flexible probes of varying size and increasing diameter, and where the strictures are dense and the lumen of the duct at these points very small, electrolysis might be utilized with great hope of success—though I have not had any experience with this method of procedure—or a canaliculæ knife might be used with after dilatations with probes.

Stricture due to the Healing of Wounds, or ulceration of the duct or abscess in the duct due to an impacted calculus, will be with difficulty, and often never, overcome by dilatation alone if the injured ends of the duct do not remain in apposition. When such is the case a fistula will result and must be treated accordingly.

Stenosis due to Foreign Bodies must, of course, be relieved by the removal of the cause, and this becomes more and more difficult according as the substance is located more and more deeply in the duct. If near the buccal orifice dilatation and the use of delicate forceps will usually be satisfactory. If the foreign body is more deeply lodged, then the duct must be slit in order to reach it, and if near the glandular end of the duct an external operation will be called for and the case becomes one of injury to duct from operative measures.

The Methods of Treatment of Salivary Fistula are too well known to more than refer to them. In the recent cases the mere covering of the external surface of the cheek over the seat of the fistula, with collodion, or the use of adhesive strips, or the use of suture may be all sufficient and the flow of saliva will be immediately directed inwards and the external opening will heal. But in the more chronic cases all sorts of expedients must be resorted to. The fistulous tissue may be excised and the fistula then treated as a recent one; or the distal end of the injured duct may be dissected out and sutured inside the cheek, and closing the external wound as before. A drainage tube has been inserted through the fistula, gradually pulled through the cheek walls, leaving only a small external opening which may be readily closed, or a seton may be used by passing a large cord through the fistula and

through the whole thickness of the cheek, and its two ends tied together at the angle of the mouth. This is moved back and forth frequently until a flow of saliva becomes established inwards and the seton removed and the external wound closed as before. This latter method is one of the oldest, and in many cases is the easiest of application and is successful.

There is a condition which presents itself rather frequently, when the patient comes to you with a swelling of the parotid of some time standing, where the question of making an external opening into the gland must be considered. If there is present pus or broken-down gland tissue, there is no option, and an external opening must be made and the diseased tissue thoroughly removed, but it must be remembered that a parotid fistula results, and the treatment has but begun. If the duct cannot be dilated and the parotid swelling reduced, an exploratory aspiration should be made, and if the escaping fluid is not purulent every effort should be made to dilate the duct or perform some operation which will direct the flow of saliva into the mouth by some one of the methods which have been mentioned for curing a salivary fistula from the duct itself. If pus is formed an external opening of sufficient size must be made, the pus allowed to escape, and the broken-down gland tissue thoroughly curetted and then proceed to render the duct patulous or to make an artificial path for the saliva by which it can reach the mouth.

There is still another class of cases where stricture of Stenson's duct causes a swelling of a lymphatic gland or glands at some distance below the parotid itself, and there is a resulting breaking down of gland tissue. This condition is undoubtedly due to the fact that the parotid lymphatic glands have efferent vessels passing to the so-called ectal cervical lymphatic glands which serve as channels for the passage of the infecting cause. The treatment of this condition is the same as that for any broken-down lymphatic gland, together with the treatment which has for its result the rendering of Stenson's duct patent.

As examples of pathological curiosities may be cited: The cases where[9] masticating food stimulated the parotid gland to such an extent that the quantity of saliva poured out was so great that the temporary result was practically that of a stenosed Stenson's duct, and the saliva transuded through the skin.

Two cases reported by Hyrtl and Deichmüller where the parotid gland contained air;[10] a case of spasmodic closure of the duct resulting in an acute marked enlargement of the parotid which

lasted for two hours;[11] a case of paroxysmal swelling of the parotid glands in a female due to hysteria, was called angioneurotic edema, or it was due to air entering a rigid Stenson's duct.

In closing, I would like to emphasize that a stricture may be due to a simple inflammatory condition due to cold. That more than one stricture may be present, that the parotid tumor may or may not contain pus, and that in dilating Stenson's duct it will be found necessary frequently to use flexible probes or bougies, which may be bellied or bulbous, and that gentleness and patience must be combined with skill and knowledge in the treatment of this interesting class of cases.

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PAPER:

TYMPANIC VERTIGO AND TUBAL OBSTRUCTION.

BY W. P. BRANDEGEE, M.D.

It is an undisputed fact that vertigo due to labyrinthine involvement, whether this involvement be either of a primary or secondary nature, is at once the most prominent and expressive symptom which the patient has to bear, the most perplexing that the physician has to treat. Clinicians have roughly divided all the cases where vertigo is present into four great classes, that is to say, vertigo incident first, upon diseases of the heart and the circulatory apparatus, second, complicating diseases of the stomach and the intestinal tract, third, associated with diseases of the eye, fourth, dependent upon diseases of the ear.

It is not the purpose of the writer to enter into any discussion whatever concerning vertigo in connection with the first three divisions mentioned, but rather to call your attention to this symptom which is prominent in a certain group of aural cases and to ask your consideration of a practical and rational method of treatment. I refer especially to those cases of tympanic vertigo due to occlusion of or obstruction within the Eustachian tube caused by a chronic low grade inflammatory process or resulting from repeated acute inflammatory attacks and the restoration of the patency of the tube by electrolysis. The pathological condition you will at once recognize. No pen picture is necessary to conjure up the processes which have slowly and surely been at work within the Eustachian tube and which result in impairment of function, tinnitus and vertigo. The method of treatment, electrolysis, may be still an untrodden path to come, and it is with the hope that perhaps others may be induced to travel over this road that the writer presents this paper. The old adage, of "Where fools rush in" etc. does not here prevail. I am well aware that electrolysis as a consistent and rational treatment for obstruction within the Eustachian tube is not recommended by certain men.

"This thing has been done before and failed, electrolysis in the urethra has proven an incomplete thing if not a practical failure, the method is not to be depended upon when other methods of

dilatation are more preferable and results more stable. Electrolysis is not scientific. Why all this enthusiasm?"

These are some of the old stock arguments against electrolysis of the tube. Before, however, setting forward any of the advantages of the galvanic Eustachian bougie, a few words as to the tubal occlusion itself, the result of this condition upon the labyrinthine contents, and the various forms of tympanic vertigo may not be amiss.

Strictures of or fibrous thickening within the Eustachian tube may result from, as I have said, repeated acute inflammatory processes which extend from the pharynx or nasopharynx into the tube, or again, may follow directly through a longer process of a blood engorgement and stasis and exudation and finally to the organization and formation of new connective fibrous tissue. The lumen of the tube is gradually encroached upon, even, and this in a large number of cases, to its final obliteration. The air within the cavity of the tympanum is absorbed gradually, none can enter into the tympanum, the atmospheric pressure from without depresses steadily the drum membrane while the ossicular chain is carried inward and the stapes is driven into the oval window and direct pressure is exerted upon the membranous labyrinth and its contents, while vertigo ensues. A purely mechanical process so far, you say, then it would seem rational that relief might be expected from a method of treatment which should be in part mechanical. In fact, one author says in a book of recent date, "A secondary labyrinthine disturbance may occur as a complication or as a sequel of changes within the middle ear and yet of itself require no treatment other than that directed to the tympanum."

This latter fact does not make it less a labyrinthian affection, the removal of the cause being the rational method for overcoming this disturbance.

Vertigo as an aural symptom is usually concomitant with one or more of the four classical symptoms for which the aural patient presents, that is, impairment of function, perversion of function, pain or discharge. Probably tinnitus is the one symptom with which vertigo is most commonly allied, and it is a matter to be noted that in the cases reported tinnitus was in nearly every instance so allied and was cured or markedly diminished while the vertigo disappeared under treatment. It is also a matter of note that when impairment of function was associated with the tympanic vertigo, that this impairment was either very marked or

else but of small moment. When deafness of only moderate degree is complained of, vertigo is not usually present.

Physical examination of these cases of tympanic vertigo presents the classical picture due to tubal obstruction, that is to say, the depressed drum membrane, some loss of lustre and marked retraction of the ossicular chain. Inflation by the catheter shows that the tubes are impervious or that the walls are very much thickened. Right here it may be said that no physical examination of the Eustachian tube or the tympanic cavity is complete until we have used the ausculation tube and the catheter.

Functional examination of these vertigo cases shows that the lower tone limit is nearly always raised, in other words, that the lesion is one of the middle ear, while the higher tone limit is normal, except in those cases where labyrinthine disturbance is very marked, when we find the higher tone limit decidedly lowered. Vertigo due to aural disorder is either subjective or objective, that is to say, the patient feels that he himself is unsteady or that the symptom is due to abnormal movement about him. The forms of aural vertigo vary from that severe type where the patient is unable to walk or to assume and maintain an upright position without support, to the milder grade where only slight giddiness or a light headedness is complained of.

The vertigo is usually unilateral and referred to the side where the aural lesion exists. In some of the cases the attacks vary in intensity and in the same individual showed a great diversity. In one case, for instance, the patient was unable to maintain an upright position and yet sudden movements of the head while in this position, did not bring on any vertigo. But one of the cases lost consciousness during her attacks of vertigo and she was undoubtedly hysterical and nervous. With hardly an exception the attacks of vertigo whether mild or very marked rendered the patients unfit for either business or social duties.

What are we going to do with these cases?

Their condition is extremely pitiable and in the eyes of the patients themselves almost irremediable. Shall we calmly administer a lot of useless drugs and keep on trying to inflate an impervious tube when we know that we are dealing with such a tube and that the vertigo is directly due to this condition? Shall we cauterize turbinate tissue and saw off ecchondroses of the septum in a wild hope to improve matters? It is logical, rather, that our efforts should first be directed to restoring the lumen of the Eustachian tube and this accomplished, it will be well then to cor-

rect pathological conditions of the adjacent cavities of the nose, naso- and oro-pharynx by means, surgical or medical. What is the most rapid and at the same time most efficient method we can employ to break down tissue and remove obstructions within the tube? Electrolysis I answer, following the method and using the instruments devised by Duel. Those, and they are not a few, who use bougies made of whalebone, wire, celluloid, etc., use unnecessary force to accomplish their ends, while in electrolysis, the current from the negative pole will do the work and no force is necessary or required except that to maintain perfect contact, that of the tip of the bougie to the stricture. Where unnecessary force is applied to breaking down tissue tactile sense is in a measure destroyed, and to compare a whalebone bougie to the small gold wire bougie, as far as tactile sensation is concerned, is like comparing a crow-bar to a divining rod.

The other advantages obtained from the Duel method of tubal electrolysis are briefly as follows:

First, A minimum amount of pain to the patient.

Second, A minimum amount of trauma to the parts.

Third, Perfect control of the instrument, and consequent nicety of adjustment and ease in manipulation.

Fourth, The perfect tactile sense conveyed to the operator.

Fifth, A minimum of necessary force applied.

Sixth, The bougie can be rendered sterile.

The gold bougies, the arrangement for insulating the catheters, the handle for the bougie, the time of contact, the amount and kind of current used, all these things have been described by Duel, Kenefick, and others, so there is no need here of any further description. Suffice it to say that the smallest bougie with a tip one millimetre in diameter is preferred for the first treatment, the larger sizes being reserved for subsequent sittings. That a low voltage of current should be selected, say from 25 to 40 volts, and only a small amperage used, about 2 to 5 milliamperes. That it should be borne in mind that electrolysis is desired and not cauterization of the parts, and that the negative pole should be the one connected to the bougie, the positive electrode being held in the hand, and that no unnecessary force whatever should be exerted. Before the bougie is passed the mouth of the Eustachian tube should be thoroughly anesthetized by cocaine.

Emphasis should also be laid upon the fact that to insure any success whatever in electrolysis of the Eustachian tube the tip of the bougie must pass clearly into the tympanic cavity. A word

of warning might not be amiss here and it will perhaps be well to remember that despite great care in manipulation, the tubal wall may be slightly injured and that, therefore, inflation should be practised within forty-eight hours after the dilatation, with great care only, lest we have to deal with an emphysema.

I beg leave to read one or two of the histories from the fourteen cases which came under my care for tympanic vertigo, and will reserve the others until another time. The cases, with one or two exceptions came in the service of Dr. Dench, at the New York Eye and Ear Infirmary where they were under the observation of Dr. Kenefick and the writer and where careful histories were taken. Although the number is very small, the results were so permanent and the relief to the patient so complete and speedy I feel impelled to bring this report to your notice for your consideration.

CASES.

Case I.—H. T., physician, male, 47 years of age, came under observation in January, 1899. Gives history of typhoid and grippe in spring of 1898. General health very good always until one month ago when vertigo was first noticed. Has been to various consultants concerning this symptom which is now constant. Patient feels nauseous and falls over to the right side. Tinnitus marked during last week and vertigo so intense that he dare not go out of doors and attempt to cross the street.

Walks with faltering step and is obliged to seek support of some kind. Patient thinks of giving up practice and desires an opinion on the matter. The patient has a worried look and is extremely nervous over the vertigo.

Physical examination:

Marked retraction of membrane and ossicular chain. Right tube markedly constricted. Left tube normal.

Functional examination:

Lower tone limit, right 512 vd.

Lower tone limit, left normal.

Upper tone limit both sides normal.

Bone conduction right minus.

Whisper and accoumeter, right 15 ft.

Was bougied, electrolysis, on Jan. 19th, 1899, and four times afterward until February 8th, 1899, when his vertigo had entirely disappeared, his nausea had gone, the tinnitus gone.

Functional examination on February 8th, 1899, showed the lower tone limit 64 vd. on the right or affected side. Whisper 30 ft.

Walks now with firm elastic step, looks well, nervousness gone.

On February 14th, 1900, about one year after his last visit the patient returned saying that he felt a trifle dizzy again. Examination showed a slight narrowing of the right tube. Electrolysis done once, giddines gone and has so far not returned. Lower tone limit 64 vd. Whisper right, 30 ft.

Case II.—K. R., female, artist, 36 years of age. Complains of vertigo, referred to right side, off and on for at least seven years, but at this time it is constant. Patient cannot attend her work. Has nausea and only finds relief in the recumbent position.

Came under observation March 26th, 1899. Tinnitus is very marked, both ears.

Physical examination: Marked retraction of the drum membranes both sides, marked retraction of ossicular chain both sides. Both Eustachian tubes stenosed.

Functional examination:

Accoumeter, right 1 in.; left, contact. Whisper (loud), right, 1ft.; left, 2 in.

Bone conduction minus.

Upper tone limit both sides, 4.2 Galton.

Lower tone limit, right, 256 vd.; left, 512 vd.

This is one of the hardest cases I have ever had to deal with. Patient was bougied, electrolysis, four times when her vertigo ceased. Tinnitus gradually disappeared and is not now noticeable, when I saw the patient a few days ago.

Functional examination in January, 1900.

Whisper, right, 8 ft.; left, 10 ft.

Lower tone limit both sides, 32 vd.

Upper tone limits, 2.8 Galton.

Has had no relapse of the vertigo or tinnitus, attends her work regularly.

Case III.—S. G., male, grocer, 56 years of age. Came under observation in December, 1900, complaining of extreme vertigo and marked tinnitus. Has gone the rounds of the clinics looking for some relief. Walks unsteadily and says he feels as though he were pitching forward. Cannot attend to his business.

Physical examination: Marked retracted drum membranes. Both tubes thickened and narrow.

Functional examination:

Lower tone limit, right, 512 vd.; left, 512 vd.

Upper tone limit, right, 2.8 Galton; left, 2.6 Galton.

Whisper (loud), right, 2 in.; left, 14 in.

Was bougied, electrolysis, four times up to March, 1901. Vertigo disappeared after second dilatation, two weeks after his first visit. Tinnitus gone.

Functional examination in April last:

Lower tone limit both sides, 64 vd.

Whisper, right, 3 ft.; left, 3 ft.

No vertigo. No tinnitus.

Case IV.—Mrs. J., 46 years of age. Housewife. Came under observation in December, 1898, complaining of marked deafness and tinnitus, vertigo so severe and constant that she cannot go around without an attendant.

Vertigo marked for last nine months and constant nausea.

Physical examination:

Both drum membranes retracted.

Both tubes markedly thickened.

Functional examination:

Lower tone, right, 128 vd.; left, 128 vd.

Upper tone limits normal.

Whisper, right, 4ft.; left, 4 ft.

Bougie, electrolysis, in March, 1899. Tow sittings, vertigo gone. Tinnitus improved but slightly.

This patient was tested again in January, 1901, and reports no return of the vertigo, tinnitus present but slight.

Whisper, right, 30 ft.; left, 30 ft.

Lower tone limits, 64 vd.

These four cases were of the severe type of tympanic vertigo. Allow me, please, a moment for one or two histories of the milder type.

Case V.—B. M., female, aged 29, school teacher. Came under observation in November, 1900. Complains of tinnitus, deafness, but especially of vertigo. No nausea only slight giddiness which is very annoying.

Physical examination:

Lower tone limits, 26 vd.

Upper tone limits normal.

Whisper, right, 15 ft.; left, 12 ft.

Bone conduction normal.

Electrolysis, both tubes, three times in all. Vertigo or dizziness gone. Tinnitus improved.

Whisper, both sides, 30 ft.

Case VI.—E. G., female, 51 years of age, housewife. Came under observation in February, 1899. Complains of dizziness and tinnitus of about six months' standing.

Physical examination: Both tubes constricted.

Functional examination:

Lower tone limits, 64 vd.

Upper tone limits, normal.

Whisper, right, 18 ft.; left, 20 ft.

Bone conduction normal. Electrolysis both tubes four times during next month. Vertigo gone. Tinnitus gone.

Whisper both sides, 30 ft.

Lower tone limits, 26 vd.

PAPER:

THE MECHANICAL TREATMENT OF NASAL SYNECHIÆ WITH DEMONSTRATION OF AN APPLIANCE.

FRANK H. KOYLE, M.D.

The subject of nasal synechiæ was so thoroughly gone into at our meeting last year by Dr. Price-Brown and Dr. Lederman that it would almost seem as if any further remarks on this distressing condition would be superfluous.

The discussion which followed, however, seemed to show a considerable divergence of opinion regarding treatment; and this, together with the conclusions arrived at by the essayists, has led me to venture a few supplementary remarks on the subject and to demonstrate my method of dealing with nasal synechiæ. As preventive treatment plays a very important rôle, the suggestion made by Dr. Lederman in his paper that a course of local treatment should be instituted to lessen the turgescence of the turbinal to be operated upon is one with which I am in full accord. His advocacy of the principle that where both the septum and the turbinal are to be operated upon, the complete effect of the operation on the turbinal should be awaited before dealing with

the septum finds me again in accord. I would suggest, however, the substitution of chromic for trichloracetic acid as a necessary factor in a successful linear operation with the galvano-cautery knife. A thin film of this acid is to be fused on an ordinary cotton-carrier and rapidly rubbed into the charred knife wound. *It is important* that the turbinal tissue be *thoroughly dried before* and *after* the application *of both the cautery knife and the acid-covered probe;* for, if this part of the technique be observed, there will be less superficial charring by the agents employed.

Since chromic acid will destroy only its own bulk of tissue, its action, if thus limited to the track of the knife-wound, contrib-

Nasal Splints as recommended by Dr. Koyle.

utes toward the formation of a much firmer eschar and very materially reduces the possibility of any swelling of the turbinal, excessive reaction being the rule if such an agent is not employed. I have found that aristol will adhere better and longer than any other powder and therefore blow it in freely as the last stage of the operation. If the avoidance of subsequent pain is absolutely necessary, orthoform would better be used instead of aristol. The patient is then cautioned not to blow his nose on the operated side for several hours at least, and always *very gently* (using the safe but inelegant countryman's method), as I regard the employment of too much force in blowing the nose as a potent cause of a turgescence which sometimes results in the formation of adhesions.

After having performed several hundred linear operations, using this technique in almost every instance where a considera-

ble reduction was found desirable, and never having had an adhesion follow, I am forced to the conclusion that the galvano-cautery knife is not such a dangerous weapon as the timid operator would have us believe.

Given a comparatively straight septum, this operation when thoroughly done will not only give sufficient space to prevent synechiæ, but will do away with the apparent necessity of a larger number of ill-advised turbinotomies and turbinectomies.

At this juncture I would like to express the opinion that the use in the nose of the galvano-cautery, *in any form*, should be strictly limited to the inferior turbinate body, with the single exception of the cautery-point applied to the cartilaginous septum in cases of severe epistaxis.

In dealing with nasal synechiæ I make use of the saw, Knight's angular scissors, two sizes of so-called "alligator" scissors, various kinds of cutting-forceps, and a small curved knife, the convex being the cutting edge, an instrument immensely superior to the small bistouries in use.

I have found Grünwald's bi-angular, upward cutting-forceps indispensable in adhesions situated high up and well back in the nose. It works on the alligator principle, the lower, but in this case the posterior, blade being the fixed one, the anterior being the movable blade or jaw.

When introduced, the posterior blade is very readily slipped behind the synechia, while the opened instrument, with its anterior blade thrown forward, gives the operator a perfect view of the tissue about to be removed.

The width of the cutting surface of any particular forceps used is determined by the width of the synechia to be excised, and great care should be taken not to wound any integral part of either septum or turbinate. As it is never possible to remove the synechia in its entirety without excising some of the mucous membrane of the septum and turbinate, it is better to proceed as stated and then to carefully snip or shave off with small scissors or knife any projecting tags within reach.

When the approximation of two surfaces joined by a band of adhesion is too close to permit the use of an excising forceps, resort may be had to the saw, the knife, or the scissors. If, after being shrunk, the outline of the turbinate can be determined, a fine saw can be used with advantage in adhesions between the septum and inferior turbinate body. Where this cannot be done, owing to the agglutination of a considerable surface of the turbi-

nal to the septum, a sharp dissector which has been thoroughly dulled will be found useful.

Synechiæ of other kinds, and found in other situations, will demand operative measures adapted to each, but the methods described have given me satisfactory results in the cases I have been unfortunate enough to encounter.

The purely *mechanical* treatment of nasal synechiæ is usually post-operative, *i. e.*, it is subsequent to operations, the after-treatment of which has been inadequate, impossible, or unavailing in the prevention of adhesions. The materials and appliances for this purpose to which we have access are numerous indeed, but in some instances they are found to be utterly valueless. Use whatever skill and material we may, adhesions sometimes *will* occur and recur in spite of the surgeon's zeal and the faithful attendance of the patient. Until recently I have found all devices more or less unsatisfactory for these difficult cases. I have, however, discovered a material and a method which have given me uniformly perfect results. The material is nothing more or less than the "modelling composition" made by the S. S. White Dental Mfg. Co., and used by dentists in taking impressions for plates. It comes in blocks four inches square and about one-eighth of an inch thick, and is hard and brittle.

The method of preparing it is as follows: Immerse a block of the composition in very hot water for a few seconds, or until it is quite soft. Take it out and place it on a previously warmed and moistened slab of marble or glass, and after cutting off a strip of about an inch with a penknife, either roll the strip with a toy rolling-pin, or some such article, or spread it out with the thumbs until it is about one-sixteenth or three thirty-seconds of an inch thick. (Several strips can be rolled out at one time thus saving time on future occasions when it is necessary to use one of these splints.) By this time the composition will have gotten too cold to be manipulated further, so it is re-dipped in fairly hot water to soften it for further shaping. Putting it down on the slab, you now cut out the pattern desired with a penknife, smoothing the sharp edges with your fingers or shaving off the edge with the penknife. *It is important to remember that the splint should be introduced while still slightly flexible* and this for two reasons. First, if allowed to get cold and stiff, or if dipped into cold water which at once hardens it, its brittleness renders its introduction difficult, if not impossible, it breaks so easily. Second, it is desirable that it should be flexible and easily moulded *both during*

its introduction and afterward when its flexibility permits it to be introduced past irregularities in the contour of the septum or obstructions elsewhere requiring a separating device which will adapt itself to all sorts of angles and curves. A splint thus prepared is of peculiar value in these conditions, for it can be moulded *after* its introduction to meet the requirements of any given case.

If it so happens that the splint has become too hard before the operator has completed his manipulations, it can be softened at any point desired by pressing against it with a strong cotton-carrier armed with cotton dipped in hot water. When allowed to cool and harden *in* the nose, it is much less brittle than when cooled before being introduced.

It is seldom that the splint gets displaced, the patient being able to spray or blow that side of the nose as freely as he wishes, and at the same time, owing to the self-moulding of the splint it does not exercise the slightest pressure. This in itself is a very important factor, since pressure from any cause or for any purpose will necessarily impair the integrity of tissues adjacent to the opposite surfaces it is desired to keep apart.

Still another advantage possessed by this splint is its absolute freedom from odor, no matter how long it remains in the nose. In one case I left the splint *in situ* for thirteen (13) days, and in another for nineteen (19) days, the patients being directed to use a simple, cleansing, alkaline spray once or twice a day. On their removal the splints were subjected to careful "sniffing" but not the slightest odor could be detected from either one. This proves that the nose during all this time was as nearly aseptic as it is possible for a nose to be, and it also proves that a splint made of this composition is non-absorbable, undergoes no deterioration and is aseptic. Just here I might add that in no case requiring operation and the introduction of this splint have I ever found a subsequent elevation of temperature. In preparing the patient for operation I *never* use bichloride solution, but instead I use a 25-per-cent. solution of glyco-thymoline, spraying both sides of the nose thoroughly under a pressure of 40 pounds, or, if necessary, 60 pounds. It is a mistake to harbor the idea that it is unsafe to use a greater pressure than 10 pounds, or, at most, 15 pounds. I do, however, regard the use of the post-nasal syringe as decidedly dangerous in preparing a case for operation, especially where even a fairly weak solution of bichloride is used. In fact, I deprecate the use of the post-nasal syringe *under any circumstances.*

In conclusion, I would say that in shaping the splints it will be found that they can be introduced more easily if a generous *scoop* is taken out of the lower border and the splint dipped in sterilized oil. With an angular thumb nasal forceps it can be slipped in very readily, since the hollowed-out part easily permits its introduction beyond the introitus. The specimens shown indicate the pattern I have found of most service.

PAPER:

TINNITUS AURIUM.

SOME REMARKS ON ITS CAUSES AND TREATMENT.

THOMAS J. HARRIS, M.D.

Every member of this Society is proud, and justly so, of the scientific progress made in the department of otology during the last twenty-five years.

It is probably true that this is equal or exceeds that made by any kindred branch of medicine in the same time. Not merely has our ability to restore lost hearing been greatly increased, but brilliant results have been secured in the incalculably more important realm of life saving. Amid this general advance, possibly because of its less importance, possibly because of its obscure nature, one symptom seems to have received little or no recognition, and yet what more annoying or distressing symptom do we have to contend with? Who of us has not been pushed to his wit's end to give relief to some intractable case of tinnitus?

It is not with the hope of offering any new thoughts on this subject that this paper is presented, but rather to serve, if it may, to stimulate investigation and call forth a general interchange of views.

The literature upon noises in the ear is surprisingly limited. Politzer's article still remains one of the most complete and authoritative. Urbanschitsch and Hartmann have contributed valuable articles in their respective books. The subject is not referred to except incidentally in Schwartze's system, nor in Gruber's excellent treatise. In recent years Randolph, Bishop and Gomez have contributed to the subject. Panse has published within a year an article in the *Archives of Otology* which shows much care and

study. We are all aware of the *frequency* of tinnitus in aural disease. As a rule it accompanies or preceeds every case at some stage of the disease. In a study of the subject made by the writer some years ago it was found that in 824 cases recorded, there were 321 cases of tinnitus (about 37 per cent). These were divided as follows:

Impacted cerumen	51 cases
O. m. chronica catarrhalis	97 cases
O. m. chronica catarrhalis adhesiva	15 cases
O. m. suppurativa chronica	30 cases
Otitis interna	26 cases
Mixed disease	44 cases
Foreign body	1 case
Otitis externa	5 cases
Eustachian catarrh	2 cases
Otitis media acuta	50 cases
	321

This percentage is probably too small. Politzer estimates that tinnitus is found in two-thirds of all ear diseases. How widely this varies in character, intensity and frequency is equally well known. It is scarcely to be doubted that the agony from it has been so great in certain cases that insanity or suicide was imminent, if not actually occurring.

At the outset a proper classification of noises in the ear is essential, without it we cannot look for any satisfactory means for their relief. That tinnitus is not due to any one single cause is now thoroughly well understood. A division then according to the more common etiological factors seems the most rational. The plan of designating tinnitus according to the particular sound it resembles is obviously unscientific. We may say then, following Hartmann, that all or most cases of tinnitus are due to one of two generic causes—either to some lesion or interference with the function of the sound-perceiving apparatus—the Labyrinth, nerve or brain centre or to some lesion or other causes interfering with the sound-conducting apparatus.

To the first is given the name of subjective tinnitus; to the second entotic tinnitus. There is still a class of cases which may be referred to as objective or reflex tinnitus.

Tinnitus resulting from some interference with the normal conduction of sound represents by far the larger number of cases. Panse has gone into this very fully in the article previously re-

ferred to. The middle ear is in intimate relation to the large blood vessels of the head, especially the lateral sinus and the internal carotid. Through these channels and others a continual coursing of blood is taking place; this without question gives rise to constant venous and arterial sounds. The only wonder is that they are not always heard and the only explanation that we are not all sufferers from this is, that in the healthy ear there exist unimpeded exits for the sounds. How easily this normal condition can be affected, any one can quickly satisfy himself by pressing firmly upon the tragus.

Any obstruction at all to the transmission of sound, whether in the middle ear, Eustachian tube or auditory canal is sufficient to produce tinnitus. A sound which is so feeble as to be lost in the open air is easily heard in a small room, so a blood sound lost by dissipation of sound waves is perceived when these waves are interfered with. Bezold has shown that in pure middle ear disease the low sounds are alone impaired or lost and Riune and Schwabach's classical laws of the intensifying of these low sounds by bone conduction are in daily use. The high notes are much less intensified by such interference. Indeed, Panse believes that for the perception of the high sounds the ossicular chain is not necessary.

Cases of tinnitus due to some interference with the sound waves represent by far the largest group we meet with. They include the various forms of obstruction to the Eustachian tube—obstruction to the external auditory canal by impacted cerumen, foreign body or inflammation and as pure types—purulent disease of the middle ear. Here also belong many cases of catarrhal disease of the middle ear. There is a group of cases closely allied to these cases and yet differing clearly from them in origin. This is the class which is known variously as reflex or objective tinnitus. It offers continual interest to the otologist. It occurs in people with normal hearing. We are usually led to regard tinnitus as a sign for approaching deafness. In these cases the tinnitus has existed possibly for years with no impairment of hearing. Occasionally the sounds are so loud as to be heard by an observer at a distance. These cases are usually due to some muscular spasm or external or nervous stimulation or anomaly. The muscular spasm may be in the tensor tympani, the stapedius, the tubal muscles or even those of the palate.

Cases, too, are reported of tinnitus due to contraction of some facial muscle through the trigeminal nerve, acting on the stape-

dius. Again tinnitus has been shown post-mortem in one case to be due to the anomalous course of the stylo-mastoid artery which ran between the branches of the stapes.

Any strong emotion or any long continued exertion may produce temporary noises in the ear. Allied to this are disturbed circulatory conditions as a result of organic heart, liver or kidney disease or anemia.

Some persistent nervous noises have been shown to be due to an aneurism in the blood vessels adjacent to the ear. In these latter cases the conduction is normal, but the sound is intensified. Some of these reflex cases cannot be regarded either as muscular or nervous, and without much question, fall into the class described by Politzer as nerve tinnitus, etc. Here an excitation of the auditory nerve exists.

Subjective Tinnitus.—This may properly include cases of noises in the ear where no reflex cause exists and all interference with the sound conduction is excluded.

In some instances the labyrinth, auditory nerve or nerve centre is directly involved, in many others there is a sharing in the difficulty with middle ear in the scleroses and anchyloses round the slopes and oval window. Doubtless in certain cases disturbance of interlabyrinth pressure is the condition present.

As instances of tinnitus the nature of which is not fully understood may be mentioned, voluntary noises. Hartmann mentions his ability to produce an audible sound at will. This is probably muscular either from the tensor tympani or the tubal or palate muscles.

Occasionally cases are met where the sound resembles melodies or human voices. A case of this kind is now under the care of the writer. He is an epileptic who always hears human voices as the aura preceding the attack. These are regarded by Politzer and others to be indicative of threatened insanity.

Diagnosis.—The diagnosis of noises in regard to their source is intimately associated with the prognosis and treatment. Many cases permit of exact localization, in other instances it is impossible, but every case demands to be carefully investigated.

Our usual method of recording tinnitus in our note books and then stopping will not suffice. As has been shown, the tinnitus may be due directly or reflexly to almost any condition in the body.

The examination includes then every method we employ for a most careful testing of the hearing. We satisfy ourselves of the

condition of the drum membrane—the mobility of the ossicles—the patency of the Eustachian tube and the condition of nose and throat. The tuning forks reveal the pitch of the noise. Panse has laid stress upon this and believes that in all cases of pure conduction interference, the sound will be low, C, C′, or rarely C″, while subjective tinnitus is always high pitched. It is questionable if this is not too sweeping an assertion, and yet in general it may be regarded as a good rule to follow: Examination of nose and nasopharynx is never to be omitted and in persistent tinnitus long continued an inquiry into possible organic disease, whether of heart, stomach, or liver, is in order as well as an examination into the blood condition.

The particular form the sound assumes is not of great importance. The number of sounds reported is myriad. It is most usually the pulsating form which is met in acute disease. This is always arterial or venous. These are the sounds which are always due to interference with sound conduction. Their nature can in many instances be determined by pressure on the blood-vessels of the neck—when they disappear for the time being. Hissing sound, as of steam escaping, which represents a large number of cases of catarrhal deafness is indicative probably of labyrinthian involvement.

Prognosis.—The outlook for persons suffering from continuous tinnitus especially after it has existed any length of time is not a particularly bright one. In many instances it will continue for a life time.

Fortunately as a rule habit steps in and the patient becomes accustomed to it and suffers much less in consequence, yet the result of treatment is not so unfavorable as is often supposed. Of the 321 cases of tinnitus previously mentioned 137 underwent treatment; of these 58 were cured, 46 improved, 33 not improved. This is by no means a hopeless prospect. Important in the prognosis is whether the sound is intermittent or continuous, whether it varies in its intensity and especially what the pitch is. Many cases of sound conduction tinnitus can be relieved if the obstruction exists in Eustachian tube or auditory canal and it is possible to overcome this.

Tinnitus, due to sclerosis, in the middle and internal ear disappears often of itself after a time. While it is true, tinnitus is in many instances the promonitory symptom of approaching deafness, we have already stated this is not always the case. Randall in an interesting communication read before the American Otological Society, cites in his own case. He has had persistent tin-

nitus for years without defective hearing due, as he believes, not to some muscle contraction, but to the separation of the moist and sticky surfaces of Eustachian tube.

Finally, it must not be forgotten that the intensity of the noise may vary according to various conditions of the weather. Temporary functional condition of the general system will influence the degree of noise.

Treatment.—What do you do for noise in the ear, is a question so often asked the aurist. The reply should be, there is no single remedy, every case is to be individually examined—the character, situation, cause of the noise determined as carefully as possible and then the proper means employed to relieve the cause so far as we may. Many times treatment to nose or throat will suffice. Carmal Jones has secured good results from turbinectomy.

To illustrate a common form, examination reveals a low-pitched noise in a person with advancing deafness, retracted drum, loss or diminution of sound for low forks and a diminished patency of Eustachian tube. The case is one of probable middle ear catarrh with a conduction-sound tinnitus. Here local treatment alone is called for and will often give entire relief. The Politzer method of infiltration is the one commonly used. This is to the mind of many aurists not sufficiently exact and much greater weight is attached to the use of the catheter with the diagnostic tube. The diagnostic tube is an important auxiliary. By it the patency of the Eustachian tube can alone be accurately determined.

The tube sound in diminished patency is characteristic, being in a stenosis of the tube with a stricture of its isthmus, very small and high pitched.

Many cases will not yield, however, to the air inflation. The narrowing has become too much organized. Here systematic dilatation with graded sizes of whálebone or celluloid bougies as recommended by Urbanschitch has accomplished brilliant results. Reëstablished patency means in such results, release on (abnormal) resistance to sound waves. It may be said then that every case of high-pitched inflation sound should be tested with the bougie for a possible stricture. This stricture is wont to occur most often at the isthmus of the tube where the bone and cartilage meet.

The bougieing is, however, too often but a temporary means of dilating the stricture and relieving the tinnitus. As a substitute and method which promises a decided advance is the use

of electrolysis suggested some years ago by Newman but recently brought forward again to this country by Duel. In this procedure the stricture is not merely dilated but by use of the negative current it is permanently dissolved. Duel has reported excellent results as regard strictures by its use.

It is too early to venture more than an opinion. The method is being tested by many aurists, and seems to promise much. The electrolysis is accomplished by fine gold bougies in rubber or rubber wound silver catheters. The current is carefully adjusted by means of a milliamperemeter and usually not more than 2 or 3 milliamperes are used. Other cases of middle ear tinnitus are dependent directly on adhesive changes in the middle ear itself and can be relieved by the use of massage to the ossicles and drum membrane. The simplest method is by means of Destruche's masseuse or that known as the Siegle otoscope and often they are sufficient. Working somewhat on the same principle, several aurists have adapted electricity, producing electrical massage in the form of a very rapid vibration. Much was expected from it and at first the results were very often gratifying. They were in our experience and that of most aurists, however, only transient and the vibrometer has, we believe, been pretty generally abandoned. Electricity, especially the Galvanic current, has been strongly recommended by some aurists. Jones states that he has succeeded in relieving a large number of cases of tinnitus, at least one-third by use of this current. The cathode is placed over the ear by means of an adapted binaural stenethoscope. The relief, if producible, will be met at the first treatment. It must be frankly said that his experience is at variance with that of most observers, including the writer. We have yet to see a case where electricity seemed to help, yet in cases where all else has failed the procedure is simple, and it should certainly be tried. Of operative procedure little is to be said. It is almost universally agreed that operation for tinnitus is rarely warranted. Where tinnitus is associated with retraction of malleus and the cause of the tinnitus is in all probability due to a tightening of tensor tympani, tenotomy of this tendon is permissible and will give at least temporary relief if the diagnosis proves correct.

Seiss, of Philadelphia, has reported favorable results in tinnitus due to sclerosis of middle ear from two methods, the application of ethyl chloral to the mastoid and the introduction of warm albolence and menthol into the middle ear per tubam. We regret

to say that in a limited number of cases, where we gave both methods careful trial, we got no success.

Where our examination shows no evidence of interference with sound waves and when all local measures prove futile, we are forced to resort to internal medication to relieve the tinnitus.

The therapeutic treatment of tinnitus is to-day exceedingly unsatisfactory. Clear indications for the use of a certain class of drugs are lacking. To a large extent we are compelled to grope in the dark. Direct nerve depressants or sedatives would seem to be called for and probably are most useful in the majority of cases. In a certain number of limited cases arterial depressants will do good. An enumeration of all the drugs employed by different observers would almost exhaust the pharmacopœia. In many instances the result of the use of the drug is not mentioned, or success has been observed in only a single case. We shall confine ourselves to what have been carefully reported or what we have used ourselves.

These, in the order of frequency with which we have prescribed them, are:

Strychnine,
Iodide of potash,
Nitro glycerine,
(Tinct.) gelseminum.
Bromide of potash,
(Tinct.) digitalis.

Strychnine sulphate in $\frac{1}{60}$ grain doses before meals gave the best results, which are not brilliant. In every case the question of sound wave interference had been previously eliminated. It was used in 17 cases; all but one pure chronic catarrh or mixed disease. Relief greater or less and in some instances only temporary was obtained in 7, or 41 per cent.

Iodide of potash was prescribed in three cases of chronic disease of the internal ear with relief in all and two cases of acute trouble with equal success while in 8 cases of mixed disease there was relief in only two or 25 per cent.

Nitro-glycerine was given in several cases with high tension of arterioles. It was often necessary to give large doses, some times as high as 20 minims in the day in order to produce decided physiological results. In at least two cases the effect on the tinnitus was flattering, but naturally the large dose could not long be continued. With digitalis on the other hand tried where there was a clear nervous or arterial tinnitus our results were uniformly dis-

appointing. In every instant the drug disarranged the stomach without influencing the noise, so that we have now abandoned its use.

Tincture Gelseminum—We began using this drug some five years ago, and have employed it in a number of cases at times with good results. We are not prepared to make too strong a claim for its value and yet the results certainly warrant making use of it, where strychnine has failed. The drug is a spinal depressant and has no decided action on the heart.

In ten cases where it was given there was relief more or less permanent to five percent. All of these improved cases, were cases of middle ear disease. The drug failed totally in cases of internal disease.

Our experience with aconite, atropine and arsenic has been very limited and totally negative. Bromide of potash so generally recommended either as the salt or in the form of hydrobromic acid has been extensively employed as a dernier resort, but without a single exception has proved a disappointment.

Some years ago Blake recommended small doses of quinine frequently repeated. In a single case where it was given and all else had failed, it seemed to give some relief. It has been previously stated any condition of the general system will have its effect on the noise. We have been wont, in associated involvement of the alimentary canal to prescribe salines or saline mineral waters with good results.

Gomaz, some six years ago, recommended conium in the form of the alkaloid.

He reported a series of cases with excellent results. We have used it recently in a number of cases, but we regret to say without any beneficial results unless in one case.

Mention should be made of the use of hot air introduced into the middle ear, as recommended by Vansant. Finally it may be of interest to refer to the use of suprareval extract. Dr. W. H. Bates has used it in over 200 cases with variable results—best in acute cases

CONCLUSIONS.

1. Tinnitus is a very common and annoying symptom in each disease.

2. Its origin is not thoroughly understood but in many cases it is due to interference of sound waves.

3. It does not always mean deafness.

4. Much can often be done for it if the exact course can be discovered.

5. Drugs are very disapointing in its treatment. Strychnine seems to give best results where local treatment has failed.

6. Careful study and recording of cases is essential to arrive at a proper understanding of the subject.

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PAPER:

MENIERE'S DISEASE.

S. MAC CUEN SMITH, M.D.,

In accepting an invitation to contribute a brief paper on this subject, the writer does so without the expectation of adding anything new to our knowledge of the subject, but with the hope that the discussion which follows may throw some light upon an affliction the exact nature of which is so little known. Since Paul Ménière read his notable paper before the Academy of Medicine at Paris in 1861, the disease which still bears his name has been the subject of much contention. Although Ménière in his famous case, showed conclusively by post-mortem demonstration that the semicircular canals were filled with clotted blood which encroached to some extent upon the cavity of the vestibule, there has always been a tendency, apparent even at this late day, to make use of, or apply the term Ménière's Disease to almost all severe aural disturbances characterized by vertigo, deafness, etc. This misunderstanding or misapplication of the disease outlined by Ménière has led to much confusion as to the actual pathology of

the lesion. Manifestly, if the term Ménière's disease means anything, it must be restricted to that complexity of symptoms at present recognized as the outcome of what is termed apoplexy of the labyrinth. Furthermore, this labyrinthine hemorrhage should be primary in its inception, and occur suddenly in a subject free from previous ear trouble, and enjoying excellent general health at the time of the attack. If then, gentlemen, such restrictions are to be placed upon this pathologic entity, how very uncommon must be a true case of Ménière's disease.

Personally the writer has long since felt that the so-called Ménière's disease is of most exceptional rarity; furthermore, if we exclude previous systemic illness as a causative factor, this disease must, with few exceptions, be regarded, from an etiologic standpoint, as the result of traumatism; and who to-day would venture a definite diagnosis in most lesions involving the base of the skull?

Since the publication of Flourens' experiments on the semicircular canals of pigeons, it has generally been accepted that in the semicircular canals we have the peripheral organs for the maintenance of equilibrium. On the other hand, "Steiner has found that, when the membranous canals of sharks have been excised, and the animals then returned to the water, there is no disturbance of locomotion. If, however, the auditory nerve be stretched, or the ossicles pulled upon, locomotion is interfered with. Similar experiments were confirmed in lizards and frogs, which would tend to show that the canals are not necessarily associated with equilibrium, and that the disturbance of locomotion has probably a central cause in the medulla." Furthermore, Magendie and Cuvier have shown that the same results may be induced by division of the transverse fibres of the pons varolii, or of the fibres running from the cerebellum to the corpora quadrigemina, or of those passing from the cerebellum to the spinal cord.

Baginsky asserts that the semicircular canals have no part in the maintenance of equilibrium; as the entire labyrinth of a dog may be destroyed without the appearance of any disturbance of this nature. Gellé speaks of Ménière's symptoms as occurring, or likely to occur, in diseases of the middle ear, in hemorrhage into the labyrinth, in hyperemia of the labyrinth, in anemia of the labyrinth, in labyrinthitis, in hyperesthesia of the labyrinth, in reflex labyrinthic vertigo and toxemias.

The lamented Gruber, to whom the writer is indebted for many of his references, affirms that "it is now certain that an

exaggerated intralabyrinthine pressure first of all takes effect upon the peri-lymph, and is then transmitted through the aqueductus cochleæ to the subarachnoid space, thereby inducing the results under discussion, if this action takes place with sufficient rapidity. The pressure may always be moderated to a certain degree, since the direction in which the aqueductus cochleæ opens into the subarachnoid space is not the most effective one. It is, however, quite otherwise with the aqueductus vestibuli; for if the pressure on the saccule becomes excessive, the endolymph can give way directly through this channel towards the cranial cavity and if the recessus Cotugnii be largely developed, it will become distended to a corresponding extent, and thus exercise a more considerable pressure upon the centre of statical equilibrium, the cerebellum, evoking symptoms of vertigo, etc. If, on the other hand, the recessus Cotugnii be but slightly developed, the phenomena in question may then be quite absent. It should likewise not be forgotten that the pressure brought to bear by the perilymph through the aqueductus cochleæ upon the extended area of the subarachnoid space is proportionately greatly lessened in its effect, a condition which does not exist in respect of the closed recessus Cotugnii."

Since, then, it seems to be definitely shown that Ménière's symptoms do not arise exclusively from a single disease of the labyrinth, but are more or less prominent in traumatisms and various other pathological changes involving the ear and adjacent structures, would not the cause of otology be best served, and much confusion averted, by adopting a nomenclature defining as far as possible the location and nature of the various affections of the internal ear without consideration of Ménière's disease. It is desirable, of course, that *Ménière's symptoms* should have proper recognition, but the term Ménière's *disease* cannot be used as at present understood without perpetuating, and probably multiplying, the confusion already extant.

In many instances an injury to the brain substance proper, rather than to the semicircular canals, is unquestionably the cause of an inability to move in a forward direction. In common with the writer, many of those present have doubtless witnessed the ability of rabbits to run at a rapid pace in a small circle after receiving a gun-shot wound of the head. Dalby's experience in this direction has shown conclusively that the wound did not in any way injure the ear, a subsequent examination disclosing the

shot located in the *cerebellum*. Dalby has suggested the term auditory vertigo to distinguish between vertigo due to lesions of the ear and that arising from other causes. This, however, seems objectionable, as the term is too general in meaning, not defining any particular disease, nor the exact portion of the ear involved.

"Tympanic vertigo," as suggested by C. H. Burnett, is an efficient and expressive term to distinguish between vertigo due to middle ear disease or disturbance of intratympanic pressure, and that involving other parts of the ear or neighboring structures. The writer is firmly of the opinion that too little importance has been given to the diseases involving organs more or less remote from the ear, which, however, play an important part in the secondary development of many pathological changes in the organ of hearing. Just as an intractable cough at times develops during the course of certain diseases of the kidneys, so also has the writer observed aural manifestations in cases suffering from nephritis, which he hopes in the near future to make the subject of a separate paper. To carry this thought a step further; is it not reasonable to presume that the benefit we sometimes secure by the use of quinine for the relief of tinnitus, is due to the fact that the tinnitus was the result of malaria and consequent anemia of the labyrinth; the quinine not only exerting its specific action on the general disease, but also relieving the labyrinthine ischemia, a condition from which most patients so afflicted probably do suffer.

The element of time and rest which is usually self-enforced, are the two most prominent factors in the treatment of a real case of Ménière's disease; and yet, counter-irritation, together with the use of the iodides, bromides, etc., probably have some virtue, and should therefore be employed.

The writer believes that most diseases of the internal ear are secondary either to some tympanic or to some systemic trouble (excluding traumatism), which must necessarily be carefully sought after and so far as possible corrected, while the local manifestations are being dealt with as the symptoms demand.

It is not the purpose of this paper to enter into a discussion of the treatment of the various diseases involving the internal ear. However, we wish to commend the employment of the subcutaneous injection of pilocarpin, as suggested by Politzer, in syphilitic affections complicating the ear. Furthermore, we desire to call particular attention to the virtues of *Zittmann's decoction* in cases where the use of mercury is indicated, in lesions of the ear.

nose or throat. The writer also desires to endorse the removal of the incus, in selected cases for the relief of tinnitus and vertigo, as suggested by Burnett.

PAPER:

TOXIC RHINITIS.

CHARLES PREVOST GRAYSON, M.D.

The title of my contribution if not actually misleading, is, at least, somewhat indefinite. It is not of the rhinitis of the infective fevers that I propose to speak, nor of that which may follow the ingestion of certain drugs. The variety that I have in mind is wholly dependent upon systemic, self-produced toxines, and it is of its etiology and, more particularly, of a certain phase of its therapeutics, that I wish to say a few words. Don't imagine, gentlemen, that I am about to regale you with another lengthy indictment of uric acid—that particular body is, I think, in some little danger of being made the scapegoat for other sins than its own. Nor am I upon the threshold of an excursion into the domain of physiologic chemistry. My only reference to it, indeed, will be contained in the expression of my belief that in it, and in it alone, will be found the explanation of about nine out of every ten coryzas that come to us for treatment. This may seem to many of you an exceedingly high proportion, your own experience may have led you to attribute the greater number of them to external rather than internal causes, the traditional chilling consequent upon some supposititious exposure may have been more often in evidence in your cases than in mine, but I am confident that I am guilty of no exaggeration when I say that this proportion fairly represents the result of my own observations.

What I have seen of these people has steadily increased my skepticism as to the reputed degree of influence exercised by cold, dampness, and draughts in the causation of coryzas. I have come to believe that they do no more than hasten what would, in all probability, occur but a little later without their assistance. I am beginning to doubt whether the man whose nutritive processes are functionally right, whose every detail of metabolism is performed with even a fairly normal amount of precision, whether such a man, even with some mechanical or other predisposing

cause within the nose, would "take cold," if you will pardon my use of the phrase, in consequence of getting his feet wet or being exposed for some few moments to a draught. In such a man I fancy the effects would be limited to a brief primary fall followed by a reactive rise of temperature, and then the perturbed heat centres would quickly regain their composure and inhibitive power, and the incident would be at an end. This bit of speculation naturally suggests the inference that I attribute to dietetic indiscretions and to the resulting metabolic inaccuracies that they provoke, rather than to imaginary exposures, the large majority of coryzas. The inference is entirely correct. I strongly suspect, nay, I am convinced that acute rhinitis is much more often the result of wet dinners than wet feet. I think I can summarize my conception of the etiology of this desease in two or three general propositions, the first of these being that, as a nation, we Americans eat, and, perhaps, drink, too much; the second, that our diet is too largely nitrogenous; and the third, that we worship the Goddess "Hurry" even at the table. These errors form a triple alliance whose influence is not for peace but war.

I shall not weary you by discussing the successive steps that lead him who is guilty of these dietetic sins, away from the straight and narrow path of hygienic rectitude into the alluring by-ways that all lead to the doctor's office. What a Pandora's box, filled to the brim with penalties, lurks in any persistent abuse of the digestive tract! And when the offense consists in any or all of the three just mentioned, the inevitable result will be a blood current loaded with nitrogenous derivatives, the whole group, in fact, of hemolytic toxines—the products, we are told, of sub-oxidation —that only wait a favorable moment to display a pernicious activity.

Who are the people who are the greatest sufferers from these recurrent, almost periodic attacks of acute rhinitis? Are they not those who are confessedly self-indulgent at the table, those who have not the time, or having this, lack both the inclination and energy, to take the vigorous exercise that might, to some extent, atone for their faults of diet? I have found it so, and it is because of the character of treatment that this experience would naturally lead us to adopt and insist upon, that certain of our patients may hold our sanity under more or less good-rumored suspicion. Of course, there is nothing novel to us, nothing irrational, in the enforcement of an actively eliminative plan of treatment for these manifestations of auto-intoxication,but the perceptive powers of

the average patient are not sufficiently developed to grasp its philosophy and its applicability to his own-self-inflicted ills.

I have no intention of saying anything about the local treatment of these attacks. That can be merely palliative and is of small consequence. It is of some of the difficulties that we encounter and have to overcome in the general management of these cases, that I wish to speak. When they are told, for instance, that they must stop their gourmandizing, and submit for a few days to a diet of milk-toast and stewed prunes, or something equally innocuous, it might be amusing if it were not annoying to see the looks of mingled scorn and amazement on their faces. And when some plethoric, overfed individual tells you in all seriousness that he must have his beefsteak and eggs and potatoes in order "to keep up his strength," doesn't it provoke you a little? I am growing weary of reasoning and arguing with such people. They come to the physician with the confident expectation that he will give them some little pill or tablet, one of which they can take every hour or so, and be fit to dine out again in the evening. And I have a vague suspicion that this is what they very often get. Not from us—perish the thought!—but from some of our censorious brothers who think that we specialists can see no farther than the tips of our own noses or the narrow boundaries of those of our patients. Those seductive little "rhinitis" and "coryza" tablets that we see in every chemist's shop, have done, I am sure, far more harm than good. The man who orders them for his patient must do so under the impression that the troublesome rhinorrhea constitutes the whole disease. If he had correct views of its causation and pathology, he could not conscientiously prescribe these combinations of opium, belladonna, and aconite for its cure. To my mind, there could not be a more lamentable exhibition of what must be either ignorance or bad judgment.

And, speaking of drugs, if we except those that may be used to empty and cleanse the gastro-intestinal tract, there are none that compare in remedial value to vigorous exercise. A half hour with the foils or gloves, a ten-mile ride on a hard trotting horse, followed by a cold shower and a hard rub, will do more to arrest and subdue an auto-toxic rhinitis such as this than the cleverest combination of diaphoretics or anti-lithics. The energizing effect of such work upon the general circulation, the vaso-motor apparatus, and the whole mechanism of excretion, will afford prompt relief where remaining indoors and being coddled will only retard the elimination of the offending toxines.

And now, gentlemen, to conclude a rather unconventional sort of paper for a general meeting of this Society, I have to ask your pardon for having made no attempt to add a single new fact to our common store of knowledge, but only to reiterate the old truth that some times management is better than medicine, and common-sense than a genius for prescription writing.

PAPER:

THE IMMUNIZING CURE OF HAY FEVER.

H. HOLBROOK CURTIS, M.D.

On June 7th, 1900, I read a paper entitled "The Immunizing Cure of Hay Fever" before the American Medical Association at Atlantic City. In this paper I gave an account of experiments which for two years I had been making of internal and hypodermic exhibition of watery extracts of flowers. A résumé of what I said at the June meeting was as follows:

"Some two years ago I reported to the Section on Laryngology of the New York Academy of Medicine the results of some experiments that had been made on a patient who, from childhood, had suffered from violent attacks of neurotic coryza, with most severe constitutional complications during the paroxysm. These attacks, simulating the most severe type of an attack of hay fever, completely prostrated the patient, and usually lasted for about two weeks. The patient, who was an unmarried woman of thirty-five, frequently presented this picture—the finger nails were cyanosed, the extremities were cold and a state of collapse supervened, which required the most vigorous measures to sustain life. These attacks were brought about by an exposure to the perfume of flowers; and so susceptible was she to these odors that to pass a florist's shop in the street would be sufficient to produce a paroxysm. It was on this patient, who was from one of the best known families of St. Louis, that I determined to try the effect of immunization by giving internally and hypodermically the watery extract of certain flowers and their pollen. I comenced by giving the sterilized infusion of roses, and after two weeks found that the patient could tolerate that flower in her bedroom. I then tried the violet and lily of the valley, and was equally successful with each flower. After I had immunized her to three flowers, it was found that add-

ing others to the bouquet always kept at her bedside did not produce any bad effect; and since then there has been no recurrence of the paroxysms that heretofore rendered her life unendurable. This patient, however, was of so pronounced a neurasthenic type —she was also tubercular—that I made a very guarded report of the case before the Laryngological Section of the Academy at that time, preferring to wait for more experience with other cases before communicating further on the subject."

Another patient once told me that it was impossible for her to go into the ipecac department of a drug house where she was employed without getting a violent "crying cold with asthma," and that when she worked in ipecac she had to take some tincture or syrup in drop doses for several days before she came in contact with the drug—a precaution which she found always prevented an attack. This young lady informed me that a friend of hers was likewise affected, and also benefited by the same precaution. It was the remembrance of this case that originally suggested to me the possibility of an immunizing treatment for hay fever. A point of especial importance is the curious fact that not only is immunity from attack secured by this mode of treatment, but also after the onset of the pollen or flower fever, and the paroxysm is at its height, the attack is at once lessened and often controlled by the exhibition of the causative drug. I have found this to be the case with golden rod and lily of the valley, and also in ragweed corasthma. A Philadelphia physician, who is affected with a violent coryza by the odor of salicylic acid, has recently told me that this disturbance does not occur while he is taking the salicylate of sodium.

The experiences narrated above prompted me last summer to obtain, through a drug firm, the services of a botanist to secure the flowers and pollen of enough ragweed to make an experiment on a large scale this year on so-called hay fever, and to determine whether the hypothetical deductions from the experiments I have already conducted are truly as important as I believe them to be. The tincture and the fluid extract are the solutions most available. In my recent experiments I have discontinued the use of hypodermic medication.

The drugs were delivered to me by Fraser so late in August of last year that the preventive treatment could not be carried out, but in no case of the eight or ten on which I tried the treatment at the commencement of the attack was there anything but re-

markable results, even when the enemy had been in full control for two weeks.

Permit me to append a letter from a Brooklyn clergyman, which is a good sample of the general estimation in which the drug is held by some of the worst cases on record:

Grace Church, Utica, N. Y., December 12, 1899.

My Dear Dr. Curtis:

Before I left Brooklyn I wanted to write and tell you how deeply I am indebted to you for the relief which you gave me from hay fever during the past summer and autumn, but the rush of moving prevented my doing so. However, you must listen to my refrain, and it may interest you:

In August, 1889, I had my first attack of hay fever when I was living in Wethersfield, Conn., from which place I removed to Brooklyn at the close of the month just mentioned. Regularly every year since on August 19th, except in 1894, when it came on August 21st, the hay fever reappeared. In three days my eyes would be so inflamed and bloodshot that a few minutes with the newspaper was as much reading as I could do; my nose became swollen and the edges of the nostrils had to be rubbed with salve after the paroxysms of sneezing to prevent them from cracking open. At least one-half of the time I could not breathe through either nostril, and panted with open mouth like a dog; in bed at night I had to prop myself up with pillows to catch any sleep at all; I had no appetite—no anything. This condition would last into October taper off in November, gradually disappearing after the arrival of the killing frosts.

My attack this year had been running for several days before I received your medicine from Fraser, and I was astonished at the abatement of the enemy in forty-eight hours. You know the rest of the story—good appetite, sleep at night, and only enough of a touch of hay fever for me to know that I was prone to the attack of the fiend.

Perhaps you will now understand why I consider myself to be

Most gratefully and sincerely yours,

B——

In the title of this paper the term hay fever is used in its popular sense, but the malady to which the treatment I have suggested applies is ragweed corasthma. I have several cases on record of golden rod and lily of the valley corasthma, which have been cured by solidago odora and convallaria majalis, respectively, in three or four days; but, while these are interesting as contributive evidence, the old enemy, ragweed is the recognized king of pollens, whose term of office begins August 12th to 20th in these latitudes, and whose cruel reign is only ended by the first frost.

If my theory be correct, that this "rhinitis vasomotor perio-

dica," or "Corasthma Ambrosiæ," may be prevented by giving from two to ten drops of the tincture of fluid extract of ambrosia artemisiæ-folia t. i. d. in water, p. c., during the two weeks preceding the paroxysm, I shall consider that I have heralded what I believe to be a great discovery with becoming modesty. If, on the other hand, the results I have obtained are not veried by othrs, I may only say that greater men and more scientific observers have been misled by initial results that time did not substantiate. I should be pleased, however, to give to any physician, who will conscientiously aid me in investigating the subject, such directions that he may experiment for himself upon severe cases, in order that a collection of reports from disinterested physicians in widely separated localities may be of benefit to the cause of scientific research.

In August, 1900, Fraser & Company, at my suggestion, combined the fluid extract of ragweed with aromatics in order to disguise its unpleasant taste and make it more palatable to the patient. With every bottle sent out, in reply to inquiries from the profession, a blank which read as follows was enclosed:

LIQUOR AMBROSIA

FOR THE PREVENTION OF HAY FEVER.

This preparation is used to immunize those cases which in these latitudes are affected about the 15th to the 20th of August.

Cocaine must not be employed as an adjunct.

As this treatment, while affording extraordinary relief to the few cases upon whom it has been tried, is still in the experimental stage, the physician who uses this bottle of medicine will confer a favor by returning this blank, properly filled out, to Fraser & Company, who will acknowledge the same.

Patient (male or female)?
Age?
How many previous attacks?
Attacks generally commenced?
Attacks generally ended?
Was asthma present?
Was nose occluded during attack?
Was nose perfectly free before attack?
Has the patient any intercurrent disease?
Does patient use alcoholic beverages?
Does patient smoke excessively?
Do other flowers than ragweed cause attacks?
Did your father or mother have hay fever?
Do your brothers or sisters suffer from the malady?

FRASER & CO.,
262 Fifth Avenue, New York City.

On October 3d, the following letter was sent to those to whom the medicine had been forwarded:

Dear Sir: The season is now so far advanced that you may be able to tell with some accuracy whether or not the "Liquor Ambrosia" has been of any use in your case of hay fever.

Kindly let us know what your experience with this remedy has been. We will not use your name in any way in this connection unless we have your permission to do so.

Respectfully,

The Fraser Tablet Triturate Mfg. Co.

Horatio N. Fraser, Pres.

The first thirty-four consecutive replies received to this letter were sufficiently satisfactory to warrant the manufacture of several thousand bottles for the continuation of the experiment another year (eighteen told of complete recoveries, four of considerable improvement, while twelve were negative). In order to get an idea of the difficulties encountered in making a fair estimate as to the value of a new remedy, I reproduce a few of the responses taken at random, without publishing the names of the writers:

Springfield, Vt.

Fraser & Co.:

Worked like magic. Patient greatly relieved in forty-eight hours, and cured in a week. Even more brilliant result in another case.

Sincerely yours,

——, M. D.

St. Cloud, Minn.

Fraser & Co.:

In reply to your letter, will say "Liquor Ambrosia" was of great use to me. It practically cured me. If I had taken it before the attack became seated on me, I feel sure it would have prevented it entirely. I intend to lay in a stock next year, and feel sure it will prove entirely effective.

Yours truly,

Middleboro, October 6, 1900.

The Fraser Tablet Triturate Mfg. Co.:

Gentlemen: The result obtained from the use of "Liquor Ambrosia" has been a success. Three bottles have been used, and the suffering at no time has been severe. The patient thus expressed himself: "The medicine has done all that could be expected."

———, M. D.

New York, August 22, 1900.

Mr. Horatio N. Fraser:

I beg leave to acknowledge receipt of the bottle of "Liquor Ambrosia" which you had the kindness to send me. I have been taking it according to directions over a period of four days, since which time I have not had any trouble from my hay rever, and during the last three days have not sneezed at all.

I beg to thank you for your thoughtfulness in supplying this remedy, and with kind regards, I remain,

Very truly yours,

Buffalo, N. Y.

Fraser & Co.:

Relief derived from the remedy has been most satisfactory. I increased dose during worst days at end of August to two or three teaspoonfuls, as necessary, to fight off the attacks. I remained in the farming section and played golf in the midst of all kinds of weeds with entire comfort. Sometimes in the worst days I took as many as fifteen teaspoonfuls of the Ambrosia in twenty-four hours.

Washington, D. C.

Fraser & Co.:

My experience with the "Liquor Ambrosia" has been very satisfactory. I am about sending notes of my own case to Dr. Curtis, but I do not wish my name used publicly, although privately I am speaking freely in its favor. I know of three cases where it seemed to greatly ameliorate the symptoms, although not taken until the middle of the attack. I thing you will be quite justified in preparing it freely for use in the next season.

Very truly,

———, M. D.

Lockport, N. Y., October 6, 1900.

The Fraser Tablet Trit. Mfg. Co.:

Dears Sirs: Replying to yours of 3d just received, I am pleased to say that my wife and myself used the "Liquor Ambrosia" during the attack of hay fever, and that it appeared to afford some relief—at least I did not suffer as much this year as during previous years. We used three bottles, and then gave it up, feeling that we did not commence its use early enough for it to act as a preventive. The attack was well on its way when we commenced its use.

We feel now we will try it next year a few weeks before the season.

Yours very truly,

Spring Lake, N. J.

Fraser Tablet Co.:

Gentlemen: In reply to your letter of October 3, I would say that I believe my son said he did not experience any particular relief from the medicine.

Very truly,

Brockton, Mass., October 9, 1900.

Fraser & Co.:

Dear Sirs: Replying to your courteous note of inquiry of the 3d inst., regarding the results of the Liquor Ambrosia in my hand, I can only say that my observation with the drug is confined entirely to its effect in my own person. Commenced August 6th taking the Liquor in ℥ i doses t. i. d., and continued it with gradually increasing doses to ℥ ii t. i. d., till September 6th. I regret to say I observed no appreciable effect; possibly the onset of my attack of hay fever was a little later in coming on, otherwise no change.

Very truly yours,

Lake Geneva, Wis., October 15, 1900.

Fraser & Co.:

Your letter to Mr. George C. —— of this place of October 3d has been handed to me for a reply, since the case of hay fever in his family was under my observation, and, being a sufferer, I took the remedy a short time.

In neither case were the results at all satisfactory. Possibly we began treatment too late in the season, the attack having begun. In both cases considerable stomach disturbance, even from minimum doses caused, after a few days' use, much inconvenience. I was much disappointed, but will give it another trial on some other cases next year. Much of our supply remains in my hands. Does it keep indefinitely?

Regretting I cannot report more favorably, I am,

Sincerely yours,

———, M. D.

Union City, Ind., October 30, 1900.

Fraser & Co.:

I secured the medicine for my own use, after receiving the reprint of Dr. Curtis's article. You will see by enclosed blank that I have experienced probably twenty attacks. Have tried out most lines of treatment promulgated by the profesion, but with very indifferent results. Attack commenced this year on the 8th of August. Received the Ambrosia on the 22d or 23d, and com-

menced taking it. Attack was an unusually severe one, with more or less asthma every night. Improvement was marked from the first day, and continued with such gratifying results that at the end of one week I discontinued the Ambrosia, and did not take it again during the season, having continued practically free of the disease. I took about one-half of one bottle during the week. After the first day of treatment I had no recurrence of asthma; after two or three days could breathe freely through the nose, the conjunctivitis disappeared, and I was practically well, although I had a slight coryza, with some sneezing during balance of the season.

Let me suggest that Ambrosia in tablet form would be a desideratum.

With regards, I am,

Yours, &c.,

From a careful estimate from all sources of information, and from my own personal experience which may cover about one hundred cases, I have concluded that those which are dependent entirely upon ragweed as an exciting cause, may become immunized in about sixty per cent. of the number treated. When there exists a mixed infection, and where the cases show a preponderance of asthmatic symptoms, a nasal spray of suprarenal extract may be employed. An internal exhibition of the suprarenal products is also beneficial to the dyspnea as well as to the edematous condition of the nasal mucous membrane.

Last year's work has demonstrated that this preparation of ragweed is in a majority of cases an adjunct of very great value in the treatment of hay-fever. Exactly how great a palliative this treatment will prove will of necessity take two or three years' work, as it is imposible to get a layman to take sufficient interest in the subject to send a proper analysis of his case, and difficult to overcome the timidity of the professional man in introducing any remedy unless he feels that his name and reputation will not suffer thereby.

I can therefore thus far only report a most satisfactory progress with the possibility of a very favorable outcome in regard to the immunizing treatment of hay-fever.

DISCUSSION.

Dr. H. L. WAGNER, having heard of Dr. Curtis' experiments, had undertaken the analysis of various extracts of flowers with the object of ascertaining what effect they might have on the serum of the blood. It seems that the so-called glycosides of the

vegetable kingdom form certain chemical combinations with the albuminoid products of the blood; he did not refer to serum albumin or serum globulin. He fully agreed with Dr. Grayson that cases of toxic rhinitis often result from the formation of certain acid products of fermentation. Just as some individuals are peculiarly sensitive to such toxins in the blood, and exhibit this idiosyncrasy by the development of rhinitis, so persons might be peculiarly sensitive to the glycosides of flowers. He intends to continue his study of this subject, and hopes to report upon it in a year or two. He has had patients develop symptoms of hay-fever after riding behind a horse, whether or not the animal had been well groomed. The peculiar smell of the horse is due to hippuric acid, and hence it occurred to him to try injections of horse urine. Instead of this, however, he decided for various reasons to employ pure hippuric acid in solution of 3 to 3½ per cent. One or two cubic centimeters were injected every third or fourth day. One of the individuals thus experimented on after eight or ten weeks of the treatment was able to drive without developing the symptoms formerly observed. The speaker said it had occurred to him that this result might possibly have been dependent upon suggestion, yet it was not inconceivable that the glycosides of flowers might combine with the side chains of substances in the blood. He thought the subject worthy of thoughtful and extended study.

Dr. E. L. Vansant, of Philadelphia, said that this subject of immunization was certainly most fascinating. Hay-fever is certainly more or less of a neurosis, and he is inclined to think that the idea of being made immune to a disease from which one has been suffering from year to year would have a profound effect on the nervous system, and this would acount for some of the beneficial results reported. The nearest approach to the action of a remedy similar to that recommended by Dr. Curtis would be that of quinine in malaria fever. That had a certain power to make one immune to malarial infection, but there the infection is a specific one, and the action of quinine appears to be a specific one, upon the malarial plasmodium in the blood. He was of the opinion that numerous examinations of the blood in cases of hay-fever might bring out valuable information.

Dr. Pierce Brown: Apparently Dr. Curtis has taken no cognizance of the effect of hay. Dr. Brown has known men to develop attacks of hay-fever after having been engaged in throwing pure timothy hay. A man sneezed more than one hundred times simply because he had thrown out one load of hay.

Dr. F. H. Koyle, of Hornellsville, N. Y., has had one case of a woman who never suffered from symptoms of hay-fever except when riding behind a horse.

Dr. L. F. Page considered the reported results from treatment with the tincture of ragweed encouraging. He had several patients who had been unpleasantly affected by driving behind a horse and he came to the conclusion that this was due to the hair

of the animal having become saturated with the pollen of various plants rather than from any peculiar emanation from the animal. For several years he secured good results in the treatment of hay-fever by restoring proper drainage, and as nearly as possible normal conditions of the mucous membrane, together with proper attention to the eliminating action of the skin and bowels. Various abnormalities of the nose, by causing pressure irritation in persons predisposed to hay-fever are often responsible for the occurrence of this disorder. He knew of several cases that have been entirely relieved years after all of the abnormalities of the nasal cavities were removed; the disturbed nerve centers had had time to regain normal resistance.

Dr. N. L. Wilson said that from the letters read by Dr. Curtis he had been persuaded to give the remedy another trial. He had used it in eight cases last year, and the only results noted had been the production of nausea and increase of the discomfort of the patient. He had been disposed to discard this treatment, not only because of these clinical results, but because one of his patients always had an attack after driving behind a horse, and another patient developed hay-fever after riding a bicycle on a dusty road. Surely Dr. Curtis could not be expected to add the fluid extract of dust to his preparation.

Dr. C. F. McGahan said that his summer practice for many years was in the home of hay-fever. Formerly those who came there were immune to the disease; in later years they had had light attacks, usually after the prevailing wind had been from the northwest. Several years ago, when assistant to Dr. Geddings, five thousand letters had been sent out to the laity with the idea of securing information about hay-fever; the result was of but little value. In his locality these hay-fever patients do not drive except after a rain, for they always develop symptoms of hay-fever. He also knew of a gentleman who had a stable about as clean as one's kitchen, and whose horses were beautifully groomed, and yet he also had hay-fever after driving behind a horse in the hay-fever season. It used to be said that the ragweed does not grow in the mountains, and hence persons are exempt from hay-fever there; this is not true, the ragweed has been found in those regions.

Even the planting of corn has been deprecated by some hay fever sufferers lest it might ruin this region as a haven for sufferers from this disease.

Dr. J. A. Stucky, of Lexington, Ky., said that he had tried Dr. Curtis's preparation, and had forwarded to him the results. In three cases the patients thought they were benefited, but they remarked that the ragweed was less virulent last season. In eight cases he had been unable to see any appreciable result, while he had obtained considerable relief from the use of a solution of suprarenal extract and chloroform, one part in seven parts of an alkaline solution, either Dobell's or Seiler's solution.

Dr. T. J. Harris only that very day was talking with a patient

who always had a rose cold on May 30, which disappeared on July 3rd. He gave this woman no treatment directed to the nose, but had endeavored to correct the high acidity of her urine and to improve the condition of her stomach. Under such treatment at one time she had gone the whole year without any rose cold. The latter was now five days overdue, so that it was possible that the treatment mentioned would again secure for her immunity this year.

Dr. E. E. Holt said that a classmate of his had been unable to ride behind a horse at any time in the year, although he had tried varius methods of grooming and cleaning the horse.

Dr. Curtis, in closing, said that in a previous communication he had cited a case in which a man had been unable to live in London since twelve years of age. He could not pass a horse in the street without having a dreadful coryza. Many specialists in London had experimented with him. It had been found that he could ride behind a horse that had been vaselined, and would not develop any symptoms until after about one hour. Persons who are sensitive to the emanations from the horse develop the symptoms when riding in a sleigh, thus eliminating the question of dust. Some persons are sensitive to emanations from elephants, cats and mice. A rose cold occurs even when there are no roses about, and is the result of an erectile tumefaction: in the later stages a true edema supervenes. He believes the most important thing in the treatment of hay fever is the elimination of uric acid, and that this is proved by the effect of low diet. He knew several opera singers whose vocal cords were so sensitive that if exposed to such emanations in a room they would be unable to sing. Enough encouragement had been found in the reports received by Fraser & Co. to lead them to manufacture 50,000 bottles for this season's consumption. He is of the opinion that the fluid extract is the more efficient preparation.

PAPER:

THE TREATMENT OF ACUTE OTITIS MEDIA.

FREDERICK L. JACK, M.D.

The title of this paper was given me by our Secretary, not, I fear, with any idea that I should add to the knowledge of one of the most important of ear diseases, but rather to provoke discussion of its treatment. It is important not only because it affects hearing but because it affects life. To detail before this Society the dangers of its extension to vital parts is quite unnecessary.

A personal experience in the line of treatment must necessarily enter into my very brief consideration of the subject. For the sake of emphasizing a few important points in the treatment of this trouble we may refer to two of its stages. The first one in which there is an hemorrhagic or congestive condition with slight if any bulging of the drum membrane. The second in which there is a secretion of fluid collection in the middle ear with bulging of the drum membrane. As, however, one stage may quickly merge into the other a sharp differentiation apparently cannot be made. To instance a few pathological conditions, there is usually an inflammation and obstruction of the Eustachian tube. In the first stage the injection of blood vessels is often confined to the membrane of Schrapnell and superior posterior quadrant of the drum membrane. In the second stage the bulging of the drum is often confined to the posterior half. Pain is the symptom most complained of by the patient and the one for which he seeks relief.

In the treatment of the first stage we seek to keep open the Eustachian tube. With this object in view in addition to treatment postnasal we resort in children to gentle inflation by means of the Politzer bag, in adults by means of the Eustachian catheter. I believe in early inflation gently performed, without pain to the patient, for by using too much energy we increase rather than diminish the amount of inflammation. Inflation by catheter when practicable seems best as there can be no danger of exciting trouble in the other ear. It is useless to enumerate the many remedies employed in the region of the fossa of Rosenmüller with the object of diminishing the swelling. Glycerine for its dehydrating

properties, and of the more recent ones, adrenalin seem most efficacious. Heat is often useful for pain. Shall it be dry or moist? In my opinion always dry. Poultices cannot be too strongly condemned. Consider for a moment the small opportunity for swelling in the ear tract walled in as it is by bone, and that by very thin bone separating many important structures. We are all familiar with the boggy condition not only of the ear itself but also of the surrounding tissues resulting from the use of poultices, which defeats, it seems to me, what should be our object, *i. e.,* to reduce the amount of swelling. Instillations of warm ear drops for the relief of pain are sometimes useful but soon produce a macerated condition of the tissues thereby rendering difficult a proper inspection of the drum.

Oily mixtures as, for example, olive oil, or a preparation of oil and chloroform are the least objectionable. I consider then, however, no more useful than the external application of dry heat. Of the various anodynes or narcotics for the relief of pain some form of opium has proved most useful. Milder remedies usually failing to control the pain the continued use of potash during the inflammation (in small doses) of bromide or soda on account of its inhibitory action is indicated. In repeated attacks of inflammation in the ear I naturally believe in eliminating all possible causes such as adenoids, nasal or postnasal obstructions.

Second Stage.—A collection of fluid in the middle ear with a bulging drum membrane. Such a condition in my experience rarely finds relief from pain or undergoes resolution without a perforation of the drum. A free incision of the drum is of the greatest importance. It is to the practicability of the operation under these conditions that I would call special attention. In speaking of the indications for an incision of the drum membrane I cannot improve on what I have already stated in a paper read before the meeting of the Massachusetts Medical Society in 1897. "By the operation several desirable ends are at once attained. In the first place, the loss of blood, together with the evacuation of collected fluid, relieves the pressure, and thereby lessens, if not stops, the pain. The rapid healing of cut surfaces, as compared to that of the ragged tear generally produced by spontaneous rupture, has a decided bearing upon the subsequent improvement in hearing. I believe also that an early incision prevents the chances of mastoid or cerebral complications. Ear trouble in very young children is frequently overlooked, at least by the general practitioner, a chance observation of aural discharge first attracting the

attention. Children usually offer little in the way of objective symptoms; they seldom place the hand over the affected ear, or in any way direct attention to the seat of trouble, whereas the general reflex nervous disorders, caused by the auditory disturbance, cover a wide range of symptoms, from slight twitching to a condition practically of episthotonos, and to marked retraction of the legs, like that seen in acute abdominal affections." Although it is unnecessary at this time to dwell upon it I can never allow an opportunity to escape of emphasizing the importance of carefully inspecting the ear in doubtful cases.

There is still another condition in which the opening in the drum membrane is of great service, not only in preventing a possible relapse but also in restoring hearing. Its importance is less frequently recognized than that which we have just considered. I refer to the collection of fluid, either serous or mucous, in the tympanic cavity, usually following an acute catarrhal inflammation without bulging of the drum membrane as seen in the first stages. The drum membrane upon inspection is found depressed from closure of the Eustachian tube, but there is seldom any considerable injection of blood vessels. The color of the drum varies with the relative thickness of the membrane and the nature of the fluid, serous exudation producing a strange color, mucous a dark grey. Often the level of the fluid is indicated by a dark line. In many cases, it is impossible to see the fluid on account of pathological changes in the membrane tympani previous to the attack. We then rely somewhat on the history and upon hearing râles by means of the autoscope after inflation of the middle ear.

I am fully aware that many of these cases improve under other treatment, but I am equally certain that many cases of progressive catarrhal deafness are made permanently worse by neglecting to free the middle ear of its fluid contents. I make this statement advisedly, and with considerable experience in the treatment of these cases, both in the usual way, and by incision through the drum membrane. I have yet to meet a case in which complete evacuation of the fluid through an opening in the drum proved other than satisfactory. On the contrary, it is not an uncommon experience for cases with doubtful history of fluid in the middle ear to present themselves for treatment after the usual means have been employed, with membrane collapsed held more or less firmly in place by adhesive bands. The operation is not difficult, provided the field is properly illuminated; it is only slight-

ly uncomfortable, and the opening usually heals in twenty-four hours.

The auditory canal and drum are first rendered aseptic by instillations of a one to five thousand corrosive sublimate solution. The point of election is in the posterior lower quadrant. A very small incision is very quickly made by a quick thrust with a sharp triangular knife, the fluid being forced out by inflation. The ease and rapidity of evacuation depend upon the nature of the fluid, thick mucous often requiring the use of small forceps, after presenting at the opening; serous fluid on the other hand, escapes into the auditory canal, and is removed by means of absorbent cotton. Several inflations of the middle ear, by means of the catheter or Politzer bag, are usually necessary to completely evacuate the middle ear. A small plug of cotton is placed in the meatus for twenty-four hours, then removed, and subsequent treatment is directed to the naso-pharynx and Eustachian tube. The relief afforded by paracentesis is immediate, and, with appropriate treatment, the danger of refilling slight. Early paracentesis, under the two conditions I have indicated, will often avert alarming symptoms, and prevent serious results, not only as regards the hearing but even the life of the patient.

By an early incision in the second stage less chance is offered for a nipple formation of the drum, an early indication that the healing may be delayed or that serious complications may arise. However, as the condition may be considered subacute, it hardly comes within the scope of this paper.

The point of election for opening is naturally over the portion of the greatest bulging. It is quite unnecessary at this time to describe the technique of operating. Suffice it to say that the incision should be as free as possible in order to secure good drainage. In adults an anesthetic may be used if so desired, primary anesthesia with ether is preferable although nitrous oxide or chloroform can be used. It is my feeling that children suffer more from the use of an anesthetic than from a quick operation like incision of the drum. It is my usual custom to proceed without its use. Personally I have little faith in the anesthetic properties of local application of cocaine on the inflamed ear, nor have I found any drug satisfactory in lessening the pain of an incision. I consider the treatment after the operation important. The use of dry wicks tend in my experience to shorten the subsequent course of the inflammation. Syringing is employed after several days but only in cases in which the secretion becomes thickened

and interferes with a free discharge. Many antiseptic fluids are used although water made sterile by boiling is often sufficient.

Inflations of the middle ear, at intervals are necessary to evacuate thoroughly the middle ear and should be continued until the hearing is restored. It is with a feeling of some embarrassment that I have presented this brief communication upon a well-known subject before experts. The importance of the subject, however, cannot be overestimated and is one well worthy our thoughtful consideration.

PAPER:

EARLY TREATMENT OF MASTOIDITIS.

CHARLES W. RICHARDSON, M.D.

The question that first suggests itself in the consideration of this subject, the early treatment of mastoiditis, is, In what stage of the suppurative otitis is it proper to consider that the time for this early treatment of the mastoiditis has arrived? This question will be answered by different clinicians according as their views differ as to the limitation of the suppurative otitis and mastoditis. To the pathologist there is no limitation, for, as is well known, in many cases of suppurative otitis there is in the beginning the presence of pus in the antrum mastoidium, although without a necessary infection of the mucosa or the formation of an abscess within the mastoid. As in many cases of suppurative otitis, with an antrum and cells more or less subjective to the irritation of a purulent discharge surcharged with infective micro-organisms, we have the possibility of infection of the mastoid, therefore we must consider that the early treatment of mastoiditis is to commence with the purulent invasion of the tympanum or attic cavities.

The first and most important indication in the early treatment of mastoiditis would be the early and free incision of the tympanic membrane. The experienced otologist can determine in the majority of cases of infection of the tympanic cavity, immediately after examination and grouping together the symptoms, whether the case is going to terminate as an acute inflammation or suppurate. It is useless to resort to palliative remedies in hopes that the case will subside without suppurating and perforation. It is cruel to allow those individuals to suffer continuously for hours,

as well as permit pent-up pus loaded with infectious micro-organisms to continue their destructive activity, when free and early incision not only relieves pain, but limits inflammatory activity and affords an egress for this infective material. The incision through the membrane should be libeeral.

The second important indication is rest. I am afraid that too little stress and importance is given to this point in the treatment of these cases. I consider this point of grave importance. Patients should be commanded to go to bed and should there remain until all pain has subsided, until the temperance has been normal for several days, and until all tenderness on pressure has disappeared. As secondary indications under this heading, we would suggest the feeding, which should be of a liquid character, and the maintaining of a free condition of the bowels.

The third indication is the care of the purulent discharge. So far as my experience goes, I find that the frequent but gentle irrigation with sterile water, at a temperature of 110° F., not only answers the purpose of removing the purulent discharge and lessening the activity of the micro-organisms, but also gives the greatest comfort to patients. I believe that the less meddlesome we are during the first forty-eight hours, the better progress our patients make.

The fourth important indication is to prevent infection of the mastoid or arrest it when it has taken place. This indication is best met by the continuous and persistent application of ice over the mastoid. I prefer the ice bag to the Leiter's coil, as the apparatus is more manageable and the degree of temperature is more evenly maintained. In many cases there is more or less tenderness over the mastoid or about the tip, indicating the necessity of limiting the inflammatory changes within the process. In these cases there is no question about the urgent demand for the use of external cold. It seems that the routine practice of the use of external cold would be of material advantage in all cases. Many cases come under our observation after several days of duration, wherein the perforation has spontaneously taken place, in which the purulent discharge is abundant, the mastoid tenderness is great, and with considerable elevation of temperature. These cases should be treated along lines above indicated, with enlargement of the perforation if necessary, and with persistent and continuous application of ice. The use of ice should be continued as long as there is evidence of improvement. Should the purulent discharge show a lessening and alteration in character, the tem-

perature curve diminish, the expression of the patient show improvement and sleep be more continuous, the tenderness show lessened intensity or diminished area, the ice should be persisted until complete relief is obtained. On the other hand, should the tenderness show no abatement, the discharge no diminution, the temperature remain elevated, the expression of the patient show no improvement for a period of forty-eight hours after the application of ice, radical intervention becomes essential. The development of edema of the tissues over the mastoid or sinking of the posterior superior wall of the auditory canal, indicates the presence of purulent accumulation within the cells, necessitating a radical intervention at once. One should be extremely cautious after the application of the ice, in summarizing the symptoms, not to give too much importance to the apparent improvement in the less essential symptoms, for in so doing one is apt to be badly misled. The symptoms to which the greatest weight should be attached are the lessening and diminution of tenderness to pressure, and the improvement in the character of the discharge. I have several times seen complete subsidence of marked edema, lowering of temperature, and complete abatement of spontaneous pain after application of ice for twenty-four hours; yet on doing the mastoid operation next day have found necrosis of the outer table of the mastoid, with extensive destruction of cellular structure, and cavity filled with pus. I should consider the continuous use of ice to be of greatest value in all recent cases before infection of antrum or cells has taken place, and in those cases of apparent infection in which the discharge is not very copious and mucopurulent in character, and in which the temperature is high. I should consider the earliest treatment for those cases, coming under our observation, with profuse purulent discharge, sinking of the posterior superior wall of the auditory canal, and edema over the mastoid, to be operative intervention at once.

DISCUSSION.

Dr. Edward B. Dench is in almost perfect accord with the readers of these papers. He is very glad Dr. Jack approves of inflation in the very early stages. He is certain that in a number of cases he has seen an acute inflammatory process within the tympanum aborted by the *gentle* use of the Eustachian catheter to restore the balance, as it were, of the drum membrane. In this congestive stage the proper use of the catheter accomplishes very much what a supporting bandage does in an inflamed limb, *i. e.*, it restores the circulation to the normal condition. If the infec-

tion is not too virulent, the disease may not go beyond the stage of congestion. He prefers the catheter to the Politzer bag except in very young children where it is practically impossible to use the catheter. He has had no experience with adrenalin, but knows that the application of a solution of nitrate of silver, from ten to forty grains to the ounce, is efficacious in many of these cases. Dry heat is also of great value; the best way to spoil a good ear is to poultice it. With reference to the use of oils, he is inclined to think they do harm by furnishing an excellent nidus for the development of the aspergillus. In the external canal the absence of light, with the presence of moisture and heat, add to the other favorable conditions for the development of such an organism. The result of the instillation of oils is the development of moulds and streptococci. Subsequently it might become necessary to incise the membrane, and under such circumstances it would be found exceedingly difficult to sterilize the canal. As to the advisability of incising the drum membrane when there is no bulging, he believes that sometimes the incision into the drum should be made even when there is no effused fluid. This is particularly true of the cases starting in with very acute pain. His experience with wick drains has not been favorable. His plan is to use irrigation immediately after the incision. Theoretically, sterile water is all right, but practically it seemed to him better to use a solution which was mildly antiseptic. Where numerous streptococci are present it seems especially desirable to diminish the virulence of the germs in the canal by an antiseptic; he prefers bichloride 1 to 3,000 or 5,000. He believes in early incision, rest in bed and the use of cold as a routine treatment, but by this he means that the case should be under a surgeon's personal observation from its inception. If there is any evidence of mastoid involvement he is strongly of the opinion that in most cases it is a little dangerous to make use of cold, because of the tendency of such an application to mask the symptoms. He cannot agree with Dr. Richardson that the cold should be left on as long as improvement is observed, for if cold does not abort an inflammatory process within forty-eight hours it will not act as an abortive measure, though it might relieve the symptoms. If the coil is left on longer the inflammatory process might be arrested in the superficial cells, and yet be progressing in the deeper cells, and such treatment might then result in intracranial involvement. Two cases made him hesitate to use cold. One was a man in the hospital with a pneumonia, for which reason the mastoid operation had been postponed and cold used. About six weeks later he was brought into the hospital in coma with choked disk. He was promptly operated upon, a brain abscess evacuated, and the man recovered. In the case of a young girl, cold had been left on for three or four days, and all of the symptoms had disappeared. The child returned to the hospital about two months later with an abscess in the posterior fossa, and a very extensive destruction of the mastoid process. Infection had taken place

through the external surface of the skull and an abscess had developed between the dura and the bone as a result of that absorption. The otologist in doubtful cases is just as much warranted in doing an exploratory operation on the mastoid as the general surgeon is justified in doing an exploratory operation in other regions. Such a procedure secures drainage, posteriorly, diminishes the risk of serious impairment of hearing, saves the patient from intracranial complications, and shortens the period of convalescence.

Dr. J. F. McKernon (New York) two years ago had read a paper before this society in which he had advocated cold in certain stages of acute mastoiditis, yet the impression had gone forth that he had advised it in all stages. When a case came under observation with beginning tenderness of the mastoid process he advocated free incision of the drum membrane, absolute rest in bed, fluid diet, free purgation and the application of the Leiter coil over the mastoid for twenty-four hours. If after this time there was marked tenderness the coil should be removed and the case watched for twenty-four or forty-eight hours. If, on the other hand the tenderness had diminished the coil should be left off and the case watched. There was no use, of course, in applying the ice coil if pus were already present. In acute mastoiditis with mastoid tenderness and a condition of congestion only the application of cold would, in the large majority of cases, abort the process. Where the predominating infection was streptococcal, he was very skeptical as to any measure proving abortive. The discharge from the external meatus should be examined bacteriologically in all of these cases. He thought the time would come when otologists would practice the exploratory mastoid operation advocated by Dr. Dench. In an uncomplicated mastoiditis it was certainly a perfectly safe operation, and he was glad that this procedure had been so earnestly advocated.

Dr. P. T. Berens said that the treatment of inflammation of the middle ear should be along the lines of free drainage and cleanliness. Irrigation should be with solutions as hot as can be borne. The Eustachian tube should be opened and this procedure could be most easily accomplished by the use of adrenalin through the catheter. He believed that heat accomplished much in the early stages of this affection. Confinement to bed was an important factor in cutting short the attack. The nose and pharynx should be kept clean, and internal medication should be resorted to. In the later stages, where there was considerable formation of pus, he found peroxide of hydrogen useful, but it should be added to the hot irrigation and dry cleansing. The effects of extreme cold and extreme heat were practically the same, and as ice masks the symptoms where heat does not, he preferred heat. Many acute cases in which one expects to find pus in the mastoid antrum yield to the treatment outlined, together with the use of hot poultices. This treatment should be persisted in for forty-eight hours, if need be, so long as the patient is comparatively comfortable and there

are no urgent symptoms. He had recently had a case completely recover, the mastoid symptoms disappearing after five days of careful nursing. In the removal of the jugular vein one often finds a thin, broad, sterno-mastoid muscle. By prolonging the incision and splitting this muscle the vein could be more easily laid bare. It was customary to split the lateral sinus and pack it with gauze; his own practice was to split the sinus the whole length of the diseased area and a little beyond, and then enucleate the split edges, leaving practically an open wound which could be easily dressed, and which could not possibly contain any pus.

Dr. T. R. Chambers exhibited the ear douche which he employs in connection with water at a temperature of 125° F. He believes that many cases of impending mastoiditis have been cured by this treatment which could never have been cured by any of the methods of treatment already described. He said that he had read a paper on this subject about one year ago, and as a result had received some inquiries regarding this douche. The instrument is made by the Davidson Rubber Company of Boston. It may be sterilized, taken apart, will fit any ear, and is indestructible. With it water at a temperature of 125° F. may be used without burning the fingers holding the instrument. It was his rule in every case to make a culture from the discharge as it exudes from the middle ear.

Dr. E. E. Holt said that in the discussion of this subject many years ago, Dr. Agnew had laid stress upon the importance of having the patient recline at an angle of 45 degrees. This was a point of some importance, as many patients are comfortable in that position but suffer a good deal if lying flat on the back. He had long ago learned from experience that many cases of earache could be relieved by introducing into the auditory canal a piece of cotton moistened with spirits of camphor, and having in its centre some red pepper. He felt sure that what had been said in previous meetings of specialists about the use of cold in inflammation of the middle ear had done much harm by encouraging general practitioners to use it indiscriminately, and without regard to the special stage in which it was alone appropriate. It was often difficult to determine whether a mastoiditis was superficial or deep.

Dr. Price Brown cited a case in which acute pain in the middle ear had developed in a lady after exposure to cold. He had applied dry heat, and within thirty-six hours she had developed mastoid tenderness. Her temperature at that time had been 101° F. He had then made a very free incision into the drum, evacuating seropurulent material. At the same time he had applied a fly blister. He believed in dry treatment, and hence he had not resorted to irrigation, fearing that it would carry infectious matter into the deeper parts. The following day the temperature had been 99°, the discharge had lasted five days, and the further recovery had been uneventful.

Dr. Sargent F. Snow was glad to hear Dr. Richardson use

the expression, "the persistent application of cold as long as it seems to be doing good," for an experience had shown him that a little latitude could be given to the forty-eight hour rule, particularly if the case were holding its own. The operation for opening the mastoid was undoubtedly one which was frequently necessary, and of great benefit, but nature, in her efforts to ward off extension of inflammation, throws out a protecting wall. Now, if one opens and clears out a mastoid, which is the seat of only slight inflammation and softening, he is very liable to break down this protecting wall, favoring infection of adjacent parts. He believed one should secure free drainage of the mastoid. If on opening the mastoid, only slight softening were found, it seemed to him sufficient to maintain free drainage, and not disturb the walls. In many cases free incision of the ear drum and of the posterior superior wall was sufficient to give all the drainage required. Sometimes the posterior superior would be found bulging again after the first incision. If this occurred, it should be again incised.

Dr. Wendell C. Phillips understood Dr. Jack and Dr. Dench to advocate the use of the catheter in acute catarrh of the middle ear. The use of the catheter or inflation of any form in acute inflammatory processes of the middle ear was not unattended by danger. He would hesitate to do this in any cases in which there was an infective process going on in the nose or in the naso-pharynx, because of the danger of carrying some of the infectious material into the Eustachian tube. He referred especially to grip cases. Whether the inflammation was catarrhal or suppurative in these cases, the less one had to do with the Eustachian orifice the better for the patient. He could imagine some cases of catarrhal inflammation where the treatment mentioned by these gentlemen would be safe. He had almost come to the conclusion that in acute inflammation of the mastoid cells, whether or not the ice coil were used, or poultices were used, little influence was exerted upon the process going on in the mastoid cells, and he had almost come to the conclusion that once a mastoid always a mastoid, and that but little could be done in the way of prevention. We should strictly define the varieties of mastoid disease. There was one type which no treatment seemed to him to reach effectively, namely, the grip cases in which streptococci are present. This was the result of his personal experience. On the other hand, if there were mastoid inflammation without these germs—in other words, a congestion or a catarrhal inflammation—the case might be influenced by treatment. Two symptoms and one condition seemed to him to mark the positiveness of the case, *i. e.*, prolonged tenderness over the antrum, bulging of the attic and the presence of streptococci in the pus. The pus should be examined microscopically in every case. Theoretically, the ice coil was better than hot applications. Poultices had been both condemned and praised in this discussion. In actual practice it seemed to him that the hot poultices certainly had a very bene-

ficial effect, though admittedly bad in theory. In any case, neither cold nor hot applications should be continued for any length of time. In the past six months in a rather large service he had taken off the ice coil at the end of twenty-four hours, and had not reapplied it for fear that the longer application would mask the symptoms. Some physicians made it a routine practice to attempt to abort a mastoid case by the use of the ice coil, yet he would insist that there were many cases which were undoubtedly operative from the time they first came under observation. He could not see how a blister could be of any benefit whatever in such cases.

Dr. J. W. McCaw's experience coincided entirely with that of Dr. Dench and Dr. Phillips: cold in these cases is entirely out of place. Mention was made of a case seen by him some time ago, where consent to operation had been withheld for the time, and the patient had been allowed up and around. He had finally come to the speaker's office with very little tenderness but a free purulent discharge from the middle ear. Immediate interference had been advised, and a typical mastoid operation had been done the next morning. The mastoid cells were found converted into a carious mass, the wall of the sigmoid was completely carious and covered with pus, yet this patient had gone around the previous afternoon attending to his occupation of civil engineer. The case emphasized the treacherous nature of these cases.

Dr. H. L. Wagner believes that in almost all cases there was a mixed infection. When there was at first a pneumococcus infection there would surely be a mixed infection in the course of a few days. If there was a pure pneumococcus infection, the prognosis was good; if the infection were mixed, and especially if streptococci were present, one should be guarded in the prognosis. This form of infection should be regarded as very serious, though he did not think that all of them really needed operation. We should not be satisfied with making an examination of pus once only, but these examinations should be repeated from time to time until satisfied with the improvement. Clinical intelligence should, however, be superior to the results of these important examinations.

Dr. R. C. Myles thought that progress was being made as to the importance of understanding the physics and chemistry of inflammation of the middle ear. Wherever free drainage occurred, an operation was rarely required. When pressure caused sloughing of bony as well as soft tissues, and led to necrosis, an operation would probably be required. He did not think quite enough attention was paid to the details of securing this drainage. For instance, the exact method of making the incision to relieve the tension in the mastoid cells was not generally stated, though Dr. Dench had made an effort in this direction. The membrane appears on inspection rather peculiar when an incision is required, and one was apt to be misled as to the exact location and extent of the incision. In some of his cases he had gone so far as to

excise a portion of the drum membrane; in others, he had made a triangular incision. He had never felt that he had made too free an incision—indeed, the more extensive the incision the better had been the after results, other things being equal.

Dr. RICHARDSON, in closing, said that he had supposed in his paper that the case was under observation from the very beginning. One derived a certain amount of intuition in connection with any work in which one has a large experience. Some cases at once indicate to the physician that an operation is required, and, of course, such cases should not be treated by the application of ice. He had had this spring a gentleman with double otitis media and streptococcus infection. The left ear went on to resolution under the application of ice. Five days afterwards, and after having applied cold for forty-eight hours, he had done a mastoid operation on the right ear. About the same time he had seen a case in which there had been very little tenderness, and a body temperature of 99° F. There were numerous streptococci in the discharge. The next day he had operated upon both mastoids, and had found extensive disease with an epidural abscess on one side. These cases were narrated to emphasize the necessity for the use of individual judgment. He had not said anything about ice masking the symptoms, only that one must be extremely careful about observing the symptoms while using the ice. He had seen as bad cases of pneumococcal infection as of streptococcal infection.

PAPER:

LITHEMIC PHARYNGITIS.

J. A. STUCKY, M.D.

By the term lithemic pharyngitis is meant, that type of pharyngitis having a close etiologic relationship to rheumatism or the lithemic diathesis. When we remember that the pharynx is more especially a portion of the alimentary tract, rather than of the respiratory tract, we can readily understand how it might be influenced by the lithemic diathesis, as this has its origin in the faulty metabolism occurring in the liver, or perhaps just as often to auto-intoxication caused by the absorption of by-products from the intestinal tract.

Of the authors of the recent leading textbooks on laryngology and rhinology—Kyle, Bosworth, Lennox Browne, Ingals, J. Price-Brown, Ballinger, McBride, Shurley, Friedrich, etc.—the views of Kyle more nearly corroborate the clinical features as observed by me, than any other.

The disease may be defined as an acute inflammatory or congestive process, caused by acid urates which have not been eliminated by the proper channels. The excess is distributed to the structures especially concerned in secretion and elimination, irritation of the superficial structures follows the marked vascularity of the pharynx rendering it particularly susceptible, the position making it more disagreeable to the patient because of use of muscles in swallowing.

The irritation is produced because uric acid in its various forms excites inflammatory reaction not only in mucous membrane of kidney, but in other mucous membrane tracts. The excessive elimination of uric acid demanded of the kidneys and inability of the organs to cope with the demand causes the deposit in other membranes. In lithemia, there may not be an excess of acid in the urine, but there may be retained and absorbed into the system the products of nitrogenous metabolism, and the local inflammatory process in the pharynx is most marked. The local manifestation of the diathesis may not be confined to the pharynx alone, but may exhibit itself in affections of the laryngeal, nasal and gastro-intestinal tract, without other constitutional symptoms.

A person whose vitality is below par is as susceptible if not more so, to an attack, through over-indulgence in eating and drinking, as during exposure to cold. The attack causes primarily no lesion, except that which is forced upon it by the irritation of the acid in the blood. There is no distinct pathological alteration, this being a local manifestation of a systemic condition.

The exact nature of the diathesis in gout, rheumatism, or lithemia has not been settled, yet the clinical phenomena, and alterations in the mucous membrane are practically the same. The attack may come gradually with slight tendency to headache, pains in muscles, especially of the neck, or it may be ushered in suddenly, without apparent cause known to the patient; when the latter is the case, the first symptom noticed is sensation of fulness and accumulation in throat, which is increased by swallowing. There is constant desire to swallow, which is attended with much discomfort, the throat having a rigid, stiff feeling and is hot, dry, and irritated. The movements of the individual, with an aggravated lithemic throat are almost characteristic, with each movement the head assuming a different position.

The attempt to clear the throat produces a sensation of pricking with a sharp instrument, showing that the affection is superficial. There is only slight elevation of temperature, the chief manifestation being soreness of throat.

The systemic disturbance as indicated by the temperature, pulse and inflammatory condition are not sufficient to account for the pain and discomfort. The redness and swelling of tissues is more marked behind the posterior pillars of fauces, while other portions of throat are but slightly congested. In most of well-marked cases the uvula was rigid, slightly swollen, congested or edematous, and pain in ear was produced by slightest attempt to swallow. In almost every cases there was the pricking and itching sensation, accompanied by feeling of tightness and constriction and of the constant presence of a foreign body. In several the acute local manifestation in the pharynx was followed by articular rheumatism, and I am convinced that the first indication in many instances of approaching articular rheumatism is felt in the pharynx. A number of cases can bring on an attack in a few hours by indulgence in eating freely of meats and sweets and drinking fermented wines.

The primary cause of lithemic pharyngitis, as well as many cases of spasmodic rhinitis or vasomotor coryza, is internal, and the exciting factor in precipitating the acute attack is not more

frequently exposure to cold, than to overindulgence in eating and drinking. These cases, as a rule, are overfed and underworked and lead a sedentary life. A starving man neither takes cold or suffers from lithemic or rheumatic troubles. "An overfed person is worse off than one who is underfed because the overfed body is taxed to dispose of what cannot be appropriated, and when not properly disposed of, remains only to be an element of danger."—J. C. Shepard.

Treatment.—The disease being a local manifestation of a systemic disorder, local treatment amounts to practically nothing except for its psychological effect, and when used must be of the simplest nature. Sprays, gargles, etc., tend rather to increase irritation. Any applications containing astringents, cocaine, or similar drugs, are contraindicated. In beginning of an attack, if inflammation is marked and the tissues swollen thorough cleansing of the pharynx, tonsils, postnasal space and anterior nares, with hot alkaline and saline solutions by means of lateral and postnasal sprays affords marked relief by removing the retained viscid secretion. After this is accomplished no further local treatment is needed except a gargle of hot mentholated alkaline solution for its soothing effect.

The cause of the trouble originating within the body and being either retention and absorption of acid urates or autointoxication caused by the absorption of by-products from the intestinal tract, our treatment must be directed to the removal of the cause. Increased metabolism by stimulating the liver and regulating the action of the bowels, also the diet and habits of the patient, not only will prevent the further formation and retention of uric acid in excess, but the autointoxication from the intestinal canal.

The drugs indicated are those that will hyperalkalize the blood and increase its solvency for urates. Subalkalinity of the blood indicates diminished oxidation, and consequently retarded nutrition, both being favorable to the formation of uric avid in the body as well as to the growth of pathological micro-organisms, in this way favoring autointoxication.

The causative systemic factors to which attention is first directed are, 1. Gastro-intestinal. 2. Cutaneous. 3. Insufficient physical exercise. In the beginning of an attack a full dose of calomel followed by a saline, repeated often enough to thoroughly cleanse the intestinal canal, is the first indication to be met. The salicylates and lithiates combined with minute doses of pilocarpine repeated until free diaphoresis takes place gives speedy relief.

The skin should be kept in order by daily bathing and friction so that its reaction shall be prompt. Most lithemics have so sluggish a cutaneous surface that it practically does not eliminate. Daily exercise with restricted diet, regulation of the hepatic and gastro-intestinal functions, gives most favorable, prompt and lasting results.

D. Braden Kyle, Nose and Throat.

Lennox Brown, Diseases of the Nose and Throat.

F. Bosworth, Diseases of the Nose and Throat.

P. McBride, Diseases of the Throat, Nose and Ear.

Friedrich, Rhinology, Laryngology and Otology.

Fletcher Ingals, Diseases of the Chest, Throat and Nasal Cavities.

J. Pierce Brown, Diseases of the Throat and Nose.

Ballinger, Throat, Nose and Ear.

Eugene Underwood, Muscular Rheumatism (*Alabama Med. Jour.*)

Shurley, Throat and Nose.

PAPER:

SUBARACHNOID INJECTION OF COCAIN AS A GENERAL ANESTHETIC FOR OPERATION UPON THE HEAD.

REDMOND PAYNE, M.D.

As ophthalmology was the first field in which the practical use of cocain as an anesthetic was demonstrated and since that demonstration by Keller in 1884 has been in extensive use the world over as a local anesthetic in diseases of the eye, ear, nose and throat, those following this line are probably more familiar with its anesthetic properties than those in any other line of practice, hence its introduction into general surgery as a general analgesic should be of particular interest to us. Although the local anesthetic effect of cocain is amply sufficient for most of the operations we are called upon to perform, there yet remains a large proportion where a general anesthetic is necessary. Both chloroform and ether as general anesthetics have a large number of deaths resulting from their administration and it is a peculiar fact that most of the deaths have resulted when the operations were very

simple. Complete unconsciousness is often one of great concern to the patient, and the surgeon is not always free from anxiety and worry. Added to these questions is the fact that there are many contraindications to the administration of both ether and chloroform as a general anesthetic, where the risk is very great, as in kidney, lung and heart complications and where the vitality is very low as in the aged, hence the introduction of a general anesthetic having apparently no contraindications of age, sex or disease is something of the greatest importance to us. Dr. J. L. Corning, of New York, I believe, was the first to demonstrate the subarachnoid injection of cocain in 1884, the same year that Koller discovered its local anesthetic effect upon the eye; but little was done with it, however, until Tuffier, of Paris, reported to the International Medical College of 1900, 130 cases in which he had been able to get profound analgesia and do all the capital operations on the lower extremities and below the diaphragm with the injection of 10 to 20 minims of a two-per-cent. solution of cocain into the subarachnoid space; the space being reached by passing the needle between the third and fourth lumbar vertebra. Since that time the method has been tried by surgeons in nearly every part of the world. Until very recently, however, it has been thought that the analgesia did not extend above the armpits. Dr. A. W. Morton, of San Francisco, I believe, was the first to prove that complete analgesia could be produced all over the body by the lumbar injection and as my clinic at the City and County Hospital, San Francisco, falls on the same days with Dr. Morton, and at the hour just preceding his, I have had an opportunity of observing the detail of most of the 270 operations he has made under spinal injection. His success in the excision of a tumor from the lower lip prompted me to make use of it in our field. I therefore lay before you my experience, and although small, if taken together with the successful use of the method in general surgery, may serve to point the way to its use in *suitable* cases in our special field.

To Produce Analgesia of the Upper Extremities.—To produce analgesia of the head simply requires that when the needle is introduced it be pointed upward and that the cocain solution be *forced* in *quickly*, as the rate of diffusion of the solution in the spinal fluid seems to be in the ratio to the rate of injection.

Preparation of Patient.—The site of injection is prepared in exactly the same way and at the same time as the field of operation.

The Instruments Used and Their Preparation.—A glass syringe, which has the barrel graduated and the piston ground to fit and can be readily sterilized by boiling is the one used. The needle is of steel, three inches long, with an external diameter of 1.1 mm.; an internal diameter of .8 mm. Its end has a short bevel with the concave portion of the bevel made dull which prevents it from cutting a plug from the skin and thus obstructing the lumen of the needle; it is connected to the syringe by a joint and with each needle there is a wire stylet. When the needles are not in use it is well to put them in a saturated solution of carbonate of soda to prevent rusting.

The Injection.—The surface of the lumbar region having been prepared, the patient is placed in a reclining position on either side and the back bowed out or made convex so as to separate the spine of the vertebræ and cause pressure of the cerebro-spinal fluid: the fourth lumbar is on an imaginary line connecting the crests of the ilium and just above this between the third and fourth lumbar in the center line the needle is introduced. Before placing the needle, however, it is best to freeze the point with ethel-chloride and make a small puncture of the skin with the point of a sharp scalpel. The needle is introduced with the point directly slightly upward and by making firm pressure it is driven in carefully; one feels the diminished resistance as the point of the needle enters the subarachnoid space, which is about two and one-half inches deep, variations depending upon the thickness of the muscles. The only positive evidence, however, of the space having been reached is the appearance of the cerebro-spinal fluid in the lumen of the needle. No injection should be made until one sees the spinal fluid. It is possible that the needle may become obstructed by tissue, which can be removed by passing the stylet, or having the patient cough, or it may be necessary to withdraw the needle, see that it is not obstructed, and introduce it again. After a drop of cerebro-spinal fluid passes, the aseptic finger is placed over the needle and the syringe previously filled with the cocain solution is adjusted to the needle; the patient who has been in a bent position is now relaxed and straightened out to *relieve* the pressure of the cerebro-spinal fluid, then the solution to be injected is forced in *rapidly* the needle removed quickly and the needle puncture closed with sterile cotton collodion. For operations upon the head a maximum dose must be used, that is, 18 to 25 minims of a two-per-cent. solution of cocain, and as the specific gravity of the cocain solution is less than that of the spinal fluid, the body is

slightly elevated in order to favor its diffusion upwards. The analgesia is complete in the lower extremities and trunk in from 3 to 8 minutes, but it requires from 15 to 30 minutes for profound analgesia to reach the head.

Preparation of the Cocain.—This is the most important part of the technique. We are all familiar with the unstable character of cocain solutions, and with the great difficulty of sterilizing the solution without injuring its anesthetic properties. Dr. Wm. C. Riley, of San Francisco, has overcome all of these drawbacks by sterilizing the crystals of cocain hydrochlorate at a temperature of 300° F.; thus sterilized in crystal form no change takes place in the anesthetic qualities of the drug. As the toxic and disagreeable symptoms in the past attendant upon cocain injection have been found to be due to some of the by-products of cocain or to its decomposition product, the absolute purity, sterility and stability of the cocain solution is very essential, hence the market product at present must be carefully tested for the quantity of pure cocain it contains, and the by-product, especially isotropic cocain, which depresses the heart, eliminated. Dr. Riley's method is to dry-heat the cocain crystals at 100° C., pulverize and place in a rubber-stoppered jar; then 30-minim vials are fired over a flame to kill the hay bacilli, and into each vial is weighed $^{6}/_{10}$ gram of the above-prepared cocain; they are then heated to 150° C. for 20 minutes; each vial is stoppered with a wax-dipped cork, and so kept indefinitely till required for use; when sterile water is added to fill the vial we have a 2-per-cent. solution, which is certain and uniform in its action. This vial containing the dry sterilized cocain is not opened until the time of use. It is rendered sterile on the outside by immersing the vial in a solution of bichloride of mercury 1 to 2,000. When ready to make the solution, the vial and cork are washed off with sterile water, the cork removed and sterile water at a temperature of 105° F. is added, which makes a two-per-cent. solution; this is removed from the vial to the syringe at the time of use. Although from 5 to 15 minutes is sufficient for profund analgesic action upon the lower extremities, it requires from 18 to 30 minutes to get satisfactory analgesic action upon the head.

The Usual Symptoms Following Injection.—There is usually some nausea 4 or 5 minutes after injection—sometimes vomiting, but this all subsides in a few minutes. There is usually some perspiration and slight cramps in the extremities. The pulse is a

little rapid at the beginning, but soon becomes about normal and remains so.

The Unusual Symptoms Following Injection.—Sometimes a subnormal temperature, chills and marked depression occur after the injection, which is now generally attributed to spinal shock due to the loss of too much spinal fluid and the injected solution not being up to the proper temperature. My cases have been without disagreeable incident, but as an example of what can occur I will quote from Dr. Morton's last report, in which he says: "I have never seen the symptoms alarming except in the following case, where I removed considerable cerebro-spinal fluid for analysis:

"Mr. Wm. V., aged seventy-two, City and County Hospital, carcinoma on the upper and inner part of scapula removed. Thirty-five minims of cerebro-spinal fluid were removed, and I injected 30 minims of 1-per-cent. solution cocain; analgesia complete in 3 minutes; pulse before operation, 80; respiration, 20; about 10 minutes after injection, pulse very weak at wrists; respiration irregular; heavy perspiration; pupils dilated; bowels moved. Patient was placed in Trendelenberg's position; artificial respiration with abdominal massage and stimulation by strychnia, nitro-glycerine and whiskey within ten minutes, pulse and respiration very good; operation was finished without pain; patient suffered with headache and nausea for 12 hours; evening temperature that day, 102° F.; next morning, 100° F.; pulse, evening, 104; morning, 93; otherwise continued normal; later injected same dose of cocain, with only a few drops of cerebro-spinal fluid passing, and cauterized carcinoma without any unusual symptoms.

Post Operative Condition of Patient.—There is frequently some headache, which lasts from 12 to 24 hours. Sometimes it is very severe, but is always relieved by 5 grain doses of antikamnia combined with ½ grain of caffein, repeated in half an hour. There is sometimes a rise of temperature to 101° or 102° on the same day or the day following the operation, but it never lasts longer than two days. This temperature has been produced by injecting salt solution into the space, so it is inferred to be due to some disturbance of the heat center. There are sometimes involuntary passages on the table, so it is best to have catharties used 48 hours before operation and not just the evening before, as is the rule in preparing for a general anesthetic.

The Question of Surgical Shock.—In none of my cases has there been surgical shock, even in the old lady, eighty years of

age, for whom I enucleated an eye, and it is claimed by those doing capital operations that the patient suffers less from shock under spinal anesthesia and reacts much sooner and better.

The Question of Mental Shock.—As a great deal of our operative work is done under local anesthesia, with full consciousness of the patient and rarely produces mental shock, I do not think it enters seriously into the question now.

The Advantages of Spinal Injection in our Field.—A great advantage is secured in having the co-operation of the patient in many of the operations upon the ear, nose and throat, in that they can place themselves in more favorable positions and enable us to operate more rapidly and effectively; and after the slight nausea and vomiting immediately following the injection, we never have this to contend with in operations upon the throat, but, on the contrary, we have the assistance of the patient in clearing the field of mucous and blood and otherwise assisting us. Although I have not yet used the method in other operations upon the eye than that of enucleation, I can readily appreciate the tremendous advantage gained by having the intelligent co-operation of the patient when operating extensively upon the ocular muscles, as in advancements.

Apparently no Contraindications.—There being apparently no contraindications of age, sex, or disease, it can always be used where either ether or chloroform is contraindicated, as in kidney, heart and lung disease. It also can always be used where the patient objects to becoming unconscious, as in taking chloroform or ether, and thus a larger percentage of cases will be brought to operation early and proportionatly better results secured.

The Question of the Safety of the Injection.—There have been up to this time about 3,000 cases reported and not one death which has occurred can be seriously attributed to the method; all this, to, when the technique of the method, the preparation of the cocain, etc., were uncertain. When the cocain is properly prepared, and the proper technique and instruments used, the method appears to be simple, safe and effective, and without any attendant dangers, although, of course, it is impossible to pass very definitely upon the value and safety of such an innovation until the technique is perfected and the results in several thousand cases reported.

The Physiological Action of Cocain in the Subarachnoid Space.—Just how the analgesic action is produced is not yet thoroughly understood; if normal salt solution is injected one gets every re-

sult except the analgesic action. Lewnadawsky has found that substances injected into the subarachnoid space enter the nerves and structure of the cord directly without passing into the general circulation. He has demonstrated this by using ferro-cyanate of sodium and carmine. When the cocain solution is thrown into the subarachnoid space and diffuses through the fluid, it affects but one nerve sense, that of pain, which it abolishes. The sense of touch, heat, cold, motion and co-ordination remain intact. It would therefore seem to have a selective action only for the nerve filaments presiding over the sensation of pain. As the analgesic action takes place quickly, frequently within two or three minutes after injection, the cocain appears to have a purely local action upon the spinal and basal centers of these filaments, and the cocain enters the nerve structures directly, as demonstrated by Lewandawsky's carmine injection, and without passing into the general circulation; hence we get none of the general affects produced by the absorption of cocain. It would appear that its analgesic action here was comparable to that secured upon the iris after the cocain has diffused through the aqueous humor and anesthetized the iris, without affecting its function. The roots of the spinal and basal nerves are bathed in the cerebro-spinal fluid which passes through the lymph channels and around the sheath which covers the nerves, and as the subarachnoid spaces communicate with the ventricles, through the foramina of Magendie, Key and Retzius, to get analgesic action upon the head is simply a matter of using a larger dose and giving sufficient time for the solution to diffuse through the cerebro-spinal fluid to the ventricles.

The operations upon the head done under spinal analgesia which I have to report comprise:

2 Simple Mastoid Operations.
1 Stacke Operation.
2 Frontal Sinus Operations.
1 Ossiculectomy.
1 Enucleation of the Eye.

Mrs. X——, eighty years of age, operated upon at the California Eye and Ear Hospital. Diagnosis: Phthisis bulbi, from perforating wound. Operation: Enucleation; 20 minims of a two-per-cent. solution of cocain injected between the third and fourth lumbar vertebræ. Analgesia complete to the neck and face in twelve minutes, but the eye was not entirely anesthetized for eighteen minutes. Pulse varied between 70 and 100; respiration practically normal. The operation was perfectly painless. There

was a slight amount of nausea but no vomiting. On the evening of the day of operation the temperature was 102°, and 101° on the day following. The headache began about four hours after the operation and became very severe; was somewhat relieved by an ice bag to the head and almost entirely relieved by one five-grain dose of antikamnia combined with one-half grain caffein. I learned later that the patient had had an attack of fever every week or so lasting two or three days for several months past, so I did not attribute this rise of temperature to the injection.

Mr. W——, thirty years of age, operated upon at the California Eye and Ear Hospital. Diagnosis: Subacute mastoiditis. Simple mastoid operation: 20 minims of two-per-cent. solution injected between the third and fourth lumbar vertebræ. Analgesia complete to armpits in fifteen minutes, but it required thirty minutes in this case before the analgesia was sufficient to begin operating on the mastoid. I must say, however, that this patient was an exceedingly nervous one and very apprehensive, and the analgesia may have been complete earlier than thirty minutes. The pulse did not go beyond 100; respiration remained practically normal. The operation occupied forty minutes; there was a slight amount of nausea and some vomiting eight minutes after injection which lasted four or five minutes. The patient felt well when the operation was finished; said he felt absolutely no pain, only the discomfort of traction by the retractors. Three hours after operation the patient complained bitterly of a very severe headache and backache. Somewhat relieved by the application of ice, but relieved entirely by the antikamnia-caffein powder.

Mr. R——, forty-five years of age, operated upon at the California Eye and Ear Hospital. Diagnosis: Suppurative disease of the frontal sinus. Operation: Curettement; 20 minims of a two-per-cent. solution of cocain injected. Analgesia complete in twenty-two minutes. Pulse varied between normal and 110; respiration 20 to 24; a little nausea and slight vomiting. Operation occupied forty minutes with absolutely no pain. Two hours afterward a slight headache, relieved at once by one dose of the antikamnia-caffein powder.

R. K., fifteen years of ago, operated upon at the City and County Hospital. Diagnosis: Old otorrhea and suppurative mastoiditis. A Stacke operation made. Eighteen minims of a two-per-cent. solution of cocain injected between the third and fourth lumbar vertebræ. Analgesia complete in lower part of body in three minutes. Analgesia of the head complete in 18

minutes. Pulse varied between 118 and 144, respiration between 20 and 28. Operation occupied one hour, with absolutely no pain except when granulations were curetted from external canal and middle ear. As this patient was but fifteen years of age, and cried and complained a great deal when his head was being shaved preparatory for operation, I think he was more alarmed than hurt when the external canal and middle ear were curetted as stated. The recovery in this case was absolutely uneventful; no headache, no rise of temperature.

Mr. M., age forty-three, operated upon at the City and County Hospital. Diagnosis: Empyema of frontal sinus and ethmoid cells. Operation: Curettement. Twenty-three minims of a two-per-cent. solution of cocain injected. Complete analgesia in 30 minutes; a little nausea and a little vomiting, which passed off in a few minutes. No pain from the operation except when the angles of the sinus were curetted, then he seemed to suffer a good deal of pain. The sinuses in this case, however, were very anomalous, having tremendous diverticulæ and the external angles following the supra-orbital ridges clear out to the external limit of the eyebrows.

W. H. A., age thirty-five, operated upon at the City and County Hospital. Operation: Re-opening of a Stacke wound and curettement of the superior and anterior walls of the mastoid antrum. Twenty minims of a two-per-cent. solution of cocain injected. Analgesia complete in 16 minutes. Pulse varied between 70 and 100, respiration between 18 and 26. There was a little nasea and vomiting. Ten minutes after the injection the patient's pulse became very weak and he felt very much depressed; $^1/_{20}$ strychnia was given; he recovered readily in a few minutes. The operation occupied 30 minutes and caused but little pain; none at all after the first 5 or 10 minutes.

R. K., age fifteen, operated upon at the City and County Hospital. Diagnosis: Old otitis, necrosis of the ossicles and granulations in middle ear. Operation: Ossiculectomy and curettement. Twenty minims two-per-cent. solution of cocain injected. Slight nausea and vomiting; passed off in 10 minutes and felt well. Analgesia complete in 30 minutes. Patient sat on a chair beside the light so that I used the head mirror and operated with much comfort, having full co-operation of the patient. Operation required 25 minutes. There was no pain except when the ossicles were grasped with forceps. The pain was not severe, however, so the patient stood it very well. Both pulse and respiration remained

practically normal. The patient felt very well when the operation was finished. No headache or other post-operative disturbance.

As I have already said, it will, of course, take thousands of cases and a perfected technique to determine the scope of the use of cocain as a general analgesic. Its safety and reliability have been pretty thoroughly demonstrated for operations upon every part of the body except the head, and I believe there are selected cases where it will serve us well in this field. There is certainly far less disturbance after its use than following the administration of general anesthetics. There is but little if any shock, and the patient is usually ready to take his meals regularly very shortly after the operation, which is a great factor in keeping up the strength and nutrition of the patient. Another thing which appeals to me strongly in its favor is the apparent innocuousness of the method and its absolute freedom from contraindications, having been used successfully in the aged, and those suffering from extensive organic heart and kidney disease; not the least advantage to us is being able to secure the co-operation of our patient in certain of the more radical operations upon the larynx, pharynx, excision of the tongue, staphylorraphy, etc., as well as many other selected operations that come within our field of practice, where such co-operation of the patient is a distinct help to the operator. The facts to be born in mind to secure analgesis of the head safely and successfully are:

First—The absolute aseptic character of all preparations.

Second—The careful preparation of the cocaine that it may be pure, sterile and free from toxic products, and that it shall be introduced at a temperature of 105° F.

Third—That the success of the analgesia of the head depends upon the larger dose than is usually used; upon its being forced into the spinal canal rapidly and directed upwards, and that at least thirty minutes be allowed for the analgesic effect to reach the head.

Fourth—That no injection should be made until the spinal fluid is seen to drop from the lumbar puncture needle, as it is only in this way that one can be sure that the cocaine solution is thrown into the spinal canal and thus enabled to diffuse through it.

Fifth—Care should be taken to place the sterile finger over the needle and prevent the loss of spinal fluid and thus avoid most of the unpleasant symptoms which have followed spinal injection.

Sixth—It is neither to recommend nor condemn subarachnoid

injection of cocaine as a general analgesic that I report these few cases to you, but simply to recite my experience with the method and point out the fact that it is posible to use the method safely and successfully for operations upon the head when, for any reason, other general anesthetics are contra-indicated. Only extended experience in the future with the method will determine its place as an analgesic.

The following form is the one used at the hospital on which is kept accurate record of the progress of such cases during operation, etc.:

CALIFORNIA EYE AND EAR HOSPITAL.

Lumbar puncture cocain.....
No. ..... April .....1901.
..... Age .....
Diagnosis .....
Operation .....
Nausea .....
Emesis .....
Pain .....
Time of injection.....
Amount injected .....m. 2 per cent. sol.....
Analgesia .....in.....minutes.
Pulse .....resp.....
Before injection .....
During operation .....
Operation finished at .....
Remarks.

DISCUSSION.

Dr. Otto J. Stein, of Chicago, said that the difficulty of sterilizing cocain had always constituted an important obstacle to its successful use in subarachnoid injections. Dr. Harold N. Moyer had done away with all this difficulty by substituting eucain. This is readily sterilized by boiling, and, so far as he knew, had produced equally good anesthetic effects when used in 4 per cent. solution.

Dr. Payne replied that eucain had not been found to possess the reliable anesthetic properties of cocain.

PAPER:

REPORT OF AN INTERESTING CASE OF ANEURISM OF THE INTERNAL CAROTID ARTERY.

WALTER B. JOHNSON, M.D.

The case of dissecting aneurism of the internal carotid artery here presented is of interest, not only in consequence of its rarity and the peculiarity of the point of exit of the first hemorrhage, but also because of the diversity of opinion which existed among various competent observers regarding the etiology.

J. R., a male, aged four years, born of Italian parents, was first visited March 15, 1900, in consultation with Drs. John H. Banta and M. Alexander Mackintosh, of Paterson, N. J.

The family history disclosed no specific tubercular or malignant disease except in the case of the maternal grandfather, who had been operated on for malignant disease of the tongue.

Previous History.—The child has previously enjoyed good health; the left ear has discharged pus for over a year since the patient had an acute suppurative otitis. Ten days before the present date Dr. Banta first attended the patient, who at that time had an acute inflammation of the throat. There was a swelling in the left tonsillar region which was accompanied by fever, nausea, pain, and the general physical symptoms attendant upon peritonsillar inflammation.

On March 14th, in the afternoon, possible traumatism may have resulted, as an Italian woman, a midwife, called and, the father states undertook to relieve the child by rupturing the tumor with the finger nail. A little blood, and he thinks some matter, was discharged.

On the evening of the same day Dr. Banta was hastily summoned, as the child was bleeding from the ear; a very considerable hemorrhage occurred, lasting about fifteen minutes.

15*th.*—An incision of the swollen mass in the tonsillar region was considered advisable, and preparation for the operation was made. The child was obstreperous while the physician was making a preliminary examination, and forcibly depressing the tongue a sudden gush of blood occurred from the left ear. The hemorrhage was very profuse and continued for over fifteen minutes,

saturating six large towels. The writer was then called in consultation. *Examination.* The patient was pale and cold; skin dry, the pulse rapid and feeble, the expression anxious and there was marked general depression. A blood-cot in the left auditory canal was removed. The inferior wall of the canal was apparently pushed upward in such a manner that no portion of the tympanum could be seen. There was a pulsation in the fluid on the line of coaptation of the canal walls. There was a tense, somewhat triangular swelling below the ear, about the size of an egg, which seemed to be limited by the fascia of the neck; no pulsation could be felt in any part of the growth, nor could any aneurismal bruit be heard.

Internally in the left tonsillar region there was a large tumor, dusky red in color, tense, and not easily compressible, which did not pulsate at any point. It involved the whole left peritonsillar region; extended downward toward the larynx and upward into the post-pharynx behind the left pillar of the fauces, and its most prominent portion pressed toward the right tonsil past the median line. Upon the anterior aspect of the tumor there was what appeared to be a dark-colored abrasion, about one-half inch in length, which was probably made by the finger-nail or by some instrument used on the preceding day by the Italian midwife. There was no hemorrhage from this point at the time of the examination. The tumor was diagnosed a "dissecting aneurism," and was thought to be due to possible ulceration of a bloodvessel from previous tonsillar disease or to traumatic injury at the hands of the Italian woman. Incision was opposed.

20th.—Another considerable hemorrhage occurred from the left ear, and on the next day and for several successive days there was a constant discharge of bloody serum from the ear.

31st.—The child was carefully examined. The swelling of the auditory canal had decreased; at the junction of the skin of the auditory canal and the tympanum were two points from which there was a discharge of a rather thick serous fluid; the tympanic membrane had a large perforation involving about one-third of its area. The tumor mass was much decreased in size externally, and internally. The patient did not return for further treatment, having employed Dr. Vigna, an Italian physician.

June 11th.—The patient was again referred to me on the advice of Dr. John C. McCoy, whom the attendant had called in consultation, as he wished to incise the tumor; incision was considered inadvisable. The patient was suffering from dyspnœa,

and seemed drowsy and stupid. The tumor was increased very much in size. The doctor reported that the child had been fairly well until three days prior to present visit, when, during an attack of enteritis and fever, the tumor suddenly increased. A hemorrhage had probably occurred which dissected downward and encroached upon the laryngeal space.

The patient was referred to Dr. C. C. Rice for an opinion, which was in part as follows:

"I cannot at this date be positive as to the character of the tonsillar swelling, as to whether it is malignant or tubercular," and on a later date: "It looks as though the tonsillar growth is malignant. I hope you will have a tracheotomy done immediately."

The case was referred to in a discussion at a meeting of the Section on Ophthalmology and Otology, New York Academy of Medicine. An expression of opinion was asked regarding the probability of the aural hemorrhage resulting from an aneurism. Dr. H. Knapp at that time asserted that he believed it possible for a dissecting aneurism to burrow upward beneath the fascia of the neck and along the floor of the bony auditory canal, and for the blood to make its exit at the junction of the skin and tympanic membrane. Some of the members of the section seemed to lean toward the probability of a hemorrhage otitis being the cause of the aural hemorrhage, inasmuch as the otitic inflammation was present as a complicating factor.

The case was examined by a number of surgeons, and the general opinion was that the tumor mass, which did not pulsate at any point, was not easily compressible, and over which no aneurismal bruit could be heard, should not be considered an aneurism.

13*th*.—The child was sent to the Paterson General Hospital, etherized, and a tracheotomy made by the writer. The tonsil which was atrophied was dissected from the tumor mass and reserved for examination. The tumor walls were smooth and tense and dusky red. Two exploratory punctures were made in the tumor with an aspirating needle, one on the anterior surface and the other on the posterior. A small quantity of blackish semi-disorganized blood was withdrawn. The report on the tonsillar mass sent to Dr. Thomas S. Cullen, of Baltimore, for examination was that in the atrophic tonsillar tisue "there is no evidence whatever of carcinoma, nor is there any suspicion of tuberculosis."

14*th*.—The patient was resting comfortably, breathing nicely through the tracheal canula; stupidity and drowsiness disap-

peared. There was slight paralysis affecting the left eye. The pupil was moderately dilated.

25th.—The tumor has decreased in size nearly one-half; the child breathes comfortably with tracheal canula corked; his general appearance is markedly improved; his appetite is very good, and the cachectic, waxy look has nearly passed away.

July 12th.—The patient has steadily improved, is about the wards and looks very well. He is still wearing the tracheal tube. The left pupil is slightly dilated; the tumor mass much decreased in size; parents took him home for a short visit.

14th.—Patient returned with a severe attack of bronchitis; coughed and expectorated through the tube large quantities of muco-pus.

29th.—Patient had a second bronchial attack, after which there was a discharge of ichorous bad-smelling pus.

September 7th.—Since last date, after recovery from bronchitis, the patient did well. The tumor gradually decreased in size, and it seemed possible that spontaneous cure would be effected. At 9.30 P. M. on this date the tumor mass suddenly increased in size; the child had a profuse hemorrhage from the nose lasting a few minutes. It subsided gradually, and the child slept quietly for about two hours, when he awoke coughing and bleeding from the mouth and both nostrils. In a very few minutes the bedding and mattress were saturated with blood, and large blood-cots formed beneath the edges of his pillow. The child lost considerably more than a quart of blood. When seen after this hemorrhage the patient was profoundly shocked, pale, cold, and apparently exsanguinated. He was restless and thirsty. His temperature was 99°, his pulse 160, and his respiration 36.

8th.—The patient's condition was such that operation for ligation of the common carotid artery was not considered advisable. At 12.45 P. M. on the same day there was another very considerable hemorrhage.

10th.—The patient died of exhaustion, no further hemorrhage having followed. Although no autopsy was permitted, there can be no question regarding the cause of death.

PAPER:

PAPILLOMATOUS GROWTHS OF THE SOFT PALATE.

WM. F. DUDLEY, M.D.

Papillomata ocur in the oro-pharynx with greater frequency than any other form of neoplasm. As they are benign in character, and generally of small size, they naturally are regarded as of but little importance, or as capable of causing nothing worse than a troublesome mechanical irritation. In text books they are treated curtly, and rather scant space is devoted to their consideration. So exhaustive a work, as that of Lennox Browne's dismisses the subject by stating that: "These benign neoplasms do not as a rule give rise to much inconvenience; but in several instances which have come under notice, the growths have been attached by a very long pedicle, and have produced violent irritation of the larynx and spasmodic cough."

Papillomata usually appear as small wartlike excrescences, or as pedunculated masses attached to the margin of the faucial pillars, the velum, the uvula, or the tonsils. They are slow of development, usually not painful, and not hemorrhagic in tendency.

Histologically, they consist of an excessive proliferation of epithelial cells, suported by a skeleton of recent connective tissue, that indicates the morphology of the tumor, by its villus protrusions upon the surface, and by its digital intrusions to or below the plane of the surrounding normal tissue from which it springs.

The requisite essentials for a papilloma are: "That the papillæ shall be formed of connective tissue, and that the epithelial layers which cover them shall be disposed, as upon normal papillæ." I venture to ask your consideration of the following report of a case of tumor of the velum, which was papillomatous in character, but was not histologically a typical papilloma. Its physical appearance was quite uncommon. Indeed, I can find but two reports of similar growths. The first given in 1896 by Dr. J. W. Gleitsmann before the American Laryngological Association, under the title of, "A Case of Unusual Laryngeal Growth," with the appended diagnosis of "Papilloma durum, probably malignum, and perhaps carinomatosum;" and the second case,

reported in 1900, before the American Medical Association, by Dr. Joseph S. Gibb, as "An Unusual Papillomatous Growth in the Larynx." His examining pathologist considered it a benign papilloma, having, however, certain structural arangement of its cells, suggestive of malignancy.

My patient was a man, seventy-one years of age. He had led a moderate and regular life, and has been remarkably free from any serious illness. When eleven years of age he had acute purulent otitis media on the left side. Since then there has been, with short intermissions, a slight discharge of fetid pus from the ear. The tympanic membrane is now absent, and the sense of hearing is quite lost on that side. At twenty-two years of age he had a slight attack of muscular rheumatism in his lower extremities. Three years ago he had acute cardiac dilatation from severe exertion, but now has fair compensation. For twenty years he has worn false teeth fixed in hard rubber plates, upon both upper and lower jaws. The dental plates were so skilfully fitted that during the following eighteen years he had no need to consult his dentist. He has had two small cystic tumors of the scalp; one ruptured spontaneously and the other was excised.

In boyhood he had numerous "warts" upon his hands. Syphilitic infection is denied. He has used wine temperately, and has smoked cigars since he was sixteen years old. For the past twenty years he has averaged twelve cigars per day. The cigars are mild domestic ones, of medium size; but he is a "hot smoker;" that is, he cuts a large piece off the point of the cigar, and smokes it vigorously and continuously. He does not inhale the smoke lower than the oropharynx, and does not exhale it through the nose. I detail this because the incoming smoke current constituted, for many years, a considerable irritant to the anterior surface of the soft palate, the hard palate having been protected by the dental plate.

I first saw the patient in November, 1899, and he stated that the tumor had then existed for about two and one-half years. It had caused him but slight discomfort until June, 1899, when deglutition became painful. The dysphagia increased, and so seriously affected his nutrition that in six (6) months his weight decreased from one hundred and seventy-two to one hundred and forty-four pounds. He was quite constantly annoyed by an excess of saliva.

Inspection revealed three growths on the anterior surface of his soft palate. The largest mass was circular in shape, was $\frac{7}{8}$ of

an inch in diameter and projected $^{3}/_{16}$ of an inch from the level of the palate. The surface was nearly flat, being rather more prominent toward the center than at the periphery. The marginal tissue slightly overhung the basic atachment, forming a sulcus $^{1}/_{16}$ of an inch in depth around the entire circumference. The neoplasm was equidistant from the lateral buccal walls. Its anterior edge was $\frac{1}{8}$ of an inch posterior to the hard palate and $\frac{1}{4}$ of an inch back of the rim of the dental plate. The body of the mass was evenly firm to the touch, but the surface was slightly nodular, and looked soft and pulpy. I would make especial mention of the color of the surface, which presented a pearly glistening appearance, white of very light gray-white in hue, shading to a drak gray at the edge. Two smaller tumors existed on the soft palate, each $\frac{1}{4}$ of an inch in diameter. One at the edge of the hard palate, and one at the free border of the velum. Excepting in size, they closely resembled the large parent mass. Post-rhinoscopic examination showed the superior or naso-pharyngeal surface of the velum to be free from any signs of inflamation or of adventitious tissue opposite the bases of the tumors. There was absolutely no zone of acute inflammation surrounding the sides of attachment, although a mild passive congestion was general to the mucous membrane of the pharynx, such as is usual in elderly persons. No glandular enlargement existed.

I removed the two daughter growths by means of a Bosworth snare, and sent the tisue to a pathologist of well recognized ability, for microscopic diagnosis. He promptly reported, "that examination of sections of the material reveals it to be composed of papilloma, underneath which is a very lawless carcinoma, which is evidently in the process of metastasis, as plugs of abortive cells can be seen in the lymphatic spaces. Any operative work must be radical to get beyond the malignant tissue."

Both wounds of operation healed within a week, the new mucous membrane being so normal in appearance that the sides of the cuts could scarcely be distinguished. The following week I called Dr. Jonathan Wright in consultation and snared off a fragment of the large mass, which I gave him for study. It was not a satisfactory sample, being largely surface growth, but the patient would not *then* allow more extensive cutting. The age of the patient, and the macroscopic appearance of the tumor, was thought to indicate posible malignancy. A few weeks later, in December, he had an attack of the epidemic influenza, which then prevailed. He had a pronounced pharyngitis accompanied by

diffuse inflammation of the left faucial tonsil. The tumor of the velum also was involved. It became exquisitely tender and more prominent by about ⅛ of an inch. The pharyngeal inflammation subsided in a few days, and the tumor returned to its former condition, excepting some increase in thickness and a greater amount of the white pulpy material upon its surface. The general health of the patient, however, was discouraging in the extreme. Deglutition was so painful that food was refused, except in a very insufficient quantity, and his vitality rapidly decreased. At night he could take only short, restless naps, and was much inconvenienced by the persistent driveling of saliva.

On February 18, 1900, I excised the entire mass, using a cold steel-wire snare, the loop being of No. 3 piano wire. Dr. Jonathan Wright was present and granted me his welcome advice and assistance. I made no effort to go deeply below the surface of the surrounding mucous membrane, as I feared that the snare would pinch up the entire thickness of the velum and make a buttonhole opening through it into the naso-pharynx. As the wire loop was being contracted, the tissue cut very hard, and I had difficulty in exerting enough traction to draw the encircling snare home into the canula. The wound bled freely at first, but this ceased in ten minutes, and not more than an ounce of blood was lost.

There was no secondary hemorrhage. The wound healed within two weeks, leaving a small stellate cicatrix, exactly flush with the surounding surface. Deglutition was painless from the day of operation. The patient then went south, and in three weeks gained seven pounds in weight. Two months later I examined him, and found the site of operation covered by apparently normal mucous membrane. He claimed to feel perfectly well. The only new development was a small wart-like prominence upon the dorsum of the tongue. It was situated in the median line, about one inch anterior to the circumvallate papillæ, directly under the former site of the parent growth upon the velum. It resembled a pimple about four or five times the size of a pin head. It was not sensitive or characteristic in color, and has in no wise changed up to the present date.

The following is the report of Dr. Wright upon his findings in the large tumor:

"After a careful examination of the microscopical appearances in the growth from the soft palate on February 18th, I am unable to find any positive evidences which I regard as sufficient to establish the diagnosis of malignant disease. Owing to the

comparative slowness of growth, lack of circumjacent infiltration and of glandular metastasis, and the non-recurrence of neighboring daughter islands, I see no other conclusion than that the growth is at present of a benign nature. I am therefore fully in accord with you as to the advisability of its extirpation by such means as his general condition will permit, rather than entertaining the opinion that it should be left alone or the patient subjected to the danger of a radical operation, involving great danger *per se.*"

The elapsed time since the operation is now fifteen months. There is no recurrence and no evidence of gland infection. The patient has entire comfort and has gained thirty-two pounds in weight. These facts tend to confirm the diagnosis of benignity and to encourage a favorable prognosis. Furthermore, non-malignancy was indicated by the absence of any zone of inflammation in the soft palate, contiguous to the attachment of the neoplasm, for the mucous membrane there was practically normal. The clinical behavior of the wound after the operation strengthened this conclusion. No attempt was made for free incision under the mass in order to include any deep extension of the new growth. In tumors asuming a malignant type, the base is the first portion to show characteristic tissue changes, and such an operation as I performed would certainly have hastened and increased any existing tendency to carcinoma.

This neoplasm differed from the true papilloma in lacking the significant digital projections of connective tissue toward the surface or into the underlying structure. It consisted rather of an excessive proliferation of epithelial cells, heaped together in a lawless manner upon the surface, and probably it dipped but slightly, if at all, below the normal face of the soft palate.

Under the microscope the question of malignancy in its initial stage must be determined mainly by the new cell growth in the lymph spaces in the sub-basic region. In this specimen the cell production was so rapid that there was a dropping of cells into the lymph spaces, but they were dead cells, simply the result of desquamation, and the second microscopic test could discover no evidence of cell multiplication within the lymphatics. The reduplication of cells in the lymph spaces is necessary to identify the malignant neoplasm, but at times it is difficult to obtain this testimony with positiveness, and both the pathologists consulted by Dr. Gleitsmann and by Dr. Gibb protected themselves in their reports by admitting the possible malignancy of the growths submitted to them for judgment.

PAPER:

A VARIATION IN THE TECHNIQUE OF SEPTUM OPERATIONS.

STEPHEN H. LUTZ, M.D.

There is no one operation that can be depended upon to correct every deviated septum. Each case has some feature individually its own. As you know, deviations are either cartilaginous, bony or both, depending on whether they are far forward or far back, high or low, being at all places in the partition that divides the two nostrils, the septum.

The instruments used are a compressing or breaking forceps and various forms of knives, gouges, spoke-shaves and Asch's cutting scissors or forceps. Plugs or splints may or may not be used afterwards. These are best made of cork or dentist's sheet rubber or cotton.

My object in bringing this one point before you, is to determine if it is a new departure or if others have done the same thing and not thought it worth reporting. I find nothing in literature regarding it.

To be brief, what I claim is that it is easier to break a septum up thoroughly before cutting than after cutting. I use the Roe or Asch straightening forceps first, with a rocking motion and either of the Asch cutting forceps or both of them if the deflection is in the middle of the cartilaginous portion of the septum, and if the deflection is high up or far forward I use the Douglas knives, and if far back the breaking up process alone is sufficient. All spurs should be carefully removed first by using saw or spoke-shave, preferably under the mucous membrane which can be raised in a flap. It is better, when possible, to do this some days or weeks before the septum itself is to be straightened. If this is not possible it can all be done at the same time or afterwards. After the spurs are removed, I grasp the septum well over the deflected portion and with an extreme rocking motion break it up well. Sometimes this suffices, no cutting having to be done.

If the nose is one that has been broken at some time, as most of these cases are, it is necessary to separate the old fragments at their lines of union. For this purpose the Douglas knives are by

all means the best. The use of moulded rubber splints or plugs of cotton may or may not be needed. Sometimes they are not needed, but I have used them all for different cases and I prefer the ones made of cork or of dentist's sheet rubber or celluloid, which can be moulded to fit each case. By moulded rubber splints I mean ones made by the operator either just before or during the operation. The process is easy and these splints are much better than any on sale at any instrument makers. Placed in hot water the dentist's rubber used to make plates, is easily moulded to any shape.

The principal point is the fact that the breaking is done first and if then found necessary, any cutting there may be to do can be done. If the septum is well broken, and by that I mean completely movable, but still covered by mucous membrane, which I try to keep as entire as posible, you cannot help but get good results. When the septum is completely broken the resiliency is overcome and will not return nor will the deflection.

PAPER:

A CASE OF PRIMARY EPITHELIOMA OF THE UVULA.

SEYMOUR OPPENHEIMER, M.D.

The primary development of an epithelioma in the tissues of the uvula is of extremely rare occurrence. So infrequently does this occur that Lenox Browne[1] states that he has seen but one case of malignant disease arising primarily in this location, his patient being a man, forty-eight years of age, in whom the uvula presented the appearance of a thick warty mass with all the characteristics of an ephithelioma. The adjacent glands were not involved and the entire growth was removed successfully. Microscopically, it consisted of typical stratified epithelial growths with small cell infiltration. There was localized activity of the surface epithelium which had invaded the subjacent tissue in cylindrical form, and there existed marked inflammatory changes.

Walker Downie[2] has also reported a case of this nature in a man of fifty-six years, who suffered from difficulty of swallowing,

[1]Diseases of the Throat. Fifth Edition.
[2]*Glasgow Medical Journal*, February, 1898.

pain and impaired breathing for two months previous to the examination. The uvula was enlarged, ulcerated, and bled on the slightest touch. The adjacent glands were not involved and the epithelioma was limited to the free portion of the soft palate. Removal was successfully effected with cocaine anesthesia and no recurrence had taken place at the time of the report, seventeen months after the operation.

The folowing case occurring in my practise was diagnosed as one of primary epithelioma of the uvula, and presents features of interest allied to the two cases previously mentioned.

T. T., a man aged eighty-one years. Referred to me by Dr. Yates, of New York. The family history was negative, with the exception of a brother, who died of malignant disease. The mother and father both lived to advanced age. All his relatives, both near and remote, have been noted for their longevity. He has always enjoyed good health until a few years ago, when following an attack of coryza, he developed bronchitis from which he has since suffered. Two years previous to the time when I first saw him, he had a stroke of apoplexy, with right hemiplegia, slight paralysis of the side still being present. He has complained, for a year or more, of irritation of the throat. He was examined at various times by his family physician with negative results, until a few weeks ago when a thickening at the tip of the uvula was noticed. This continued to increase until I saw him, when examination revealed a growth the size of a walnut, involving the entire uvula from its tip to its junction with the soft palate. The adjoining tissues presented nothing abnormal; the growth was bluish-red in color, not ulcerated, and firm to the touch. The cervical glands were slightly enlarged, but not tender, and the only symptom complained of, in addition to those noted, was slight pain radiating to the ears.

A small piece of the growth was removed for examination and the report of the pathologist, Dr. E. K. Dunham, confirmed my diagnosis of epithelioma. The sections removed for microscopic examination were stained after the usual methods and showed the stroma to be the seat of a considerable inflammatory reaction, while the epithelial cells were arranged as in a typical picture of epithelioma, with the presence of nuclear changes as shown by numerous mitotic figures indicating rapid cell proliferation. (See accompanying illustration).

On account of the age of the patient, the glandular involvement,

and his general impairment of health, operative interference was not considered advisable.

Although the prognosis is necessarily grave in epithelioma of the upper respiratory tract, yet in the few cases that have been recognized early and in which all the diseased tissues were removed, the favorable result, for a time at least, of operation would warrant a brighter outlook than has heretofore been given. In the case of a patient in good physical condition, primary epithelioma of the uvula, if removed early, presents but little tendency towards recurrence but if surgical measures be adopted as late as in the case here reported, especially with the glandular system showing involvment, rapid recurrence is the rule. Of interest in this connection is the fact that the location of the growth seems to exercise a restraining influence upon the natural tendency of this form of malignant disease to spread. In consequence of the histological structure of the uvula, an epithelioma usually originates in the muciparous glands and for a considerable time is limited to these structures; sections of the uvula showed the tubulated arrangement of the proliferating cells.

Ulceration of a primary epithelioma in this region does not usually take place until very late in the course of the disease; the absence of ulceration acounting for the trifling annoyance the affection produces until the growth has increased in size sufficiently to interfere with swallowing. The loss of free movement of the uvula produces faulty phonation, and, as the movement becomes still further restricted by the growth increasing in size, liquids have a tendency to enter the choanæ.

Pain is not a prominent or constant symptom in the early development, and when it does occur it is irregular and not at all severe; the contrary is the case, however, when the disease has involved other tissues and ulceration has taken place. Usually the most constant feature complained of by the patient is the slight faucial irritation due to a moderate inflammatory reaction and to some œdema which usually accompanies the malignant changes.

OBITUARY.

DR. WILLIAM H. DALY.

The sudden and tragic death of Dr. William H. Daly of Pittsburg, on June 9th, 1901, was a shock not only to his intimate friends, but to the whole medical profesion. Death is always sad, and doubly so if directed by one's own hand, when frenzied with grief, or in a moment when reason is dethroned. No one, who knew Dr. Daly intimately, his ever genial disposition, and exuberant spirits, would think of him taking his own life. Possessed with wealth ample for the indulgence of every wish, a professional and social distinction to be envied by the most ambitious, death, indeed, would seem to be a most unwelcome guest. If health he had not, his personal appearance and conversation did not indicate it,—to the extent at least, that life was a burden to him.

Less than two years ago, his life was saddened by the death of his wife to whom he was devotedly attached. This, it is pleasing to think, was the only tie that bound him to life, and, being weary of his loneliness, with impatient hand he beckoned the Dread Messenger that summoned him hence. When found by the housekeeper, in his bath-room, he was dead, with a pistol shot wound in his temple that told, too plainly, the manner of his death.

William Hudson Daly was born in Blairsville, Indiana County, Pennsylvania, September 11, 1842, a son of Thomas and Helen (Mar) Daly. His father was of Scotch descent, but a native of Ireland; his mother was also from a Scotch family. When 17 years of age, his parents died, and he took up his residence in Richmond, Va. Two years later, the Civil War began, and he entered the Confederate Army, in Company B, 15th Virginia Volunteers, and participated in most of the early battles from Big Bethel to Lees Mills, where he was taken prisoner by the Federal troops. Soon after, he took the oath of allegiance, and entered the Jefferson Medical College, at Philadelphia, 1863-64. Before he finished his medical education, he was offered a position as medical cadet in the Germantown hospital, and later was ap-

pointed acting assistant Surgeon U. S. A., and was assigned to duty in the army hospital at White Hall, Pa. From there he was transferred to Savannah,Ga., for services in the general army hospital being subsequently appointed post assistant surgeon at Hiltonhead, S. C. In August, 1865, in company with other medical officers, he was sent to Jacksonville, Fla., to receive and care for the last 5,000 prisoners liberated from Andersonville, Ga. After the war, he entered the medical school of the University of Michigan, and was graduated in 1866, and began his practice in the city of Pittsburg, continuing until the time of his death. In 1878 he went to Europe, where he spent a year in the various schools and hospitals of London, Paris, Berlin and Vienna, studying the diseases of the nose, throat and ear.

In 1871 he was commissioned Lieutenant-Colonel and Surgeon in Chief of the 18th Division Pennsylvania National Guards, which position he resigned in 1875.

At the outbreak of the Spanish war he was appointed Major and Chief Surgeon of the United States Volunteers, and was assigned to duty on the staff of Lieutenant-General Nelson A. Miles. It was upon the report of his observation that the "embalmed beef," supplied to the army, was made a subject of investigation.

As a recognition of his standing among laryngologists, he was chosen president of the section of laryngology of the ninth international medical convention, which met at Washington, D. C., in 1878. He organized and became the first president of the section of Laryngology and Otology of the American Medical Association, which met at Cincinnati. He was a member and president (1896) of the American Laryngological Association.

In 1897 he was elected president of the American Laryngological, Rhinological and Otological Society, and was made chairman of the health section of the American Social Science Association in the same year. For ten consecutive years he was recording secretary of the Allegheny County Medical Society, and later its president. He was senior physician of the Western Pennsylvania Hospital from the time of its organization until his death. He was a member of the State Medical Society of Pennsylvania; the British Medical Society; the British Laryngological, Rhinological and Otological Association; the Societe Francaise de l'Otologie de Laryngologie et de Rhinologie, and American Medical Association, of which he was a representative in the Eighth International Congress, which met at Copenhagen, Den-

mark, in 1884, and of the British Medical Association, to which he was three times sent as a delegate by the American Medical Association.

Mr. Daly possessed qualities which made him a conspicuous and popular figure. In addition to the gifts which raised him to a high rank in his profession, he was distinguished by rare force of character, sturdy manhood and courageous loyalty to what he believed to be his duty. These traits manifested themselves notably in the battle which was waged, side by side, with Major General Miles, against the rascally army contractors, who harvested illicit profits during the Spanish-American War. Although the army ring was against him, and the tremendous power of the War Department was brought to play to frighten and discredit him, he neverflinched, but held his ground to the finish and won at the bar of public opinion the case which military officialdom found means of deciding the other way.

To the medical world, the death of Dr. Daly is a distinct loss. His reputation as a laryngologist and scientist was international. His contributions to medical literature were many, and too well known to need mention here.

In his death, this society loses one of its most distinguished and most popular members.

M. R. W.

PROCEEDINGS OF MEETING
OF
SOUTHERN SECTION
HELD AT RICHMOND, VA., DEC. 1, 1901.

ADDRESS OF THE CHAIRMAN,

JOHN A. WHITE, M.D.

Gentlemen—My Friend, Dr. Upshur, has, in the fitting and eloquent terms so natural to him, made you welcome on the part of the general profession of this city. It remains for me, as Chairman of the Southern Section of this now well-known Association, to give you greeting on the part of the specialists in this section of the country, and especially on the part of those of us who reside in this our city of Richmond. That such distinguished gentlemen have honored us by their presence is an occasion for congratulation; that more have not done so is a subject of keen regret. Many, if not all of you, are known far and wide as special stars in the firmament of rhinology, otology and laryngology, and your names are so familiar in the literature of these subjects that what this gathering lacks in numbers is somewhat compensated for by the material present. *Verbum sap.* While not as bad a case as the wedding feast, it came very near it. Most of the guests invited, if they had not just married a wife, or bought a yoke of oxen, had similar excuses for not attending this meeting. Some are just about to commit matrimony, but no one in the chrysalis state of bachelorhood, on the eve of developing into a Benedict, should neglect one of his last opportunities to take a day off before being bound in those loving fetters which bring the obligations that accompany family ties. It is a case of ignorance, but not "where ignorance is bliss." Whilst his privileges will be greater, his freedom will be curtailed, and if he adheres to the old chivalric motto of "noblesse oblige" he can no longer do as he would desire.

The natural tendency of our people is to become so absorbed in business that even our recreation is taken under the guise of business. We live under a greater strain, and have fewer holidays and less relaxation than any other nation. This has never been better exemplified than in the present attempt at a gathering

of Southern specialists, and particularly of those who belong to this Society. Its Southern members are few in number, only twenty-five all told, in the Southern and Southwestern States. There are possibly fifty to seventy-five more who have not yet joined it. I have written to all of them that I consider eligible to membership, but they are scattered over so wide an expanse of country, the distances from any selected meeting place are so great, and objections to losing a few days from business so pronounced, that it is almost impossible to get them together. We can get but a corporal's guard as best, even with the attractions offered by the presence of our distinguished confrères north of us.

The Southern Section is yet an infant, that requires careful nursing, good feeding, and attractive entertainment. Even the historic city of Richmond, the Mecca of many pilgrims, with its far-famed Virginia hospitality and the renown of its lovely women, drags an almost empty net.

The value of association and co-operation, as great factors of modern civilization, the possibilities they offer for mutual benefit and improvement, and the advantages they give for professional advancement are not as much appreciated and practically utilized by us as they are by those of you who live farther North. We should consider this truth more carefuly, and try to foster the interest of such an association as this, even if we are sure that the assembly will not be a large one. The happiness and progress of mankind has as often been furthered by small events as by great happenings, and none can foresee, no one foretell, how rich may be the fruit that will spring from the seed sown by the ideas suggested, the thought exchanged, and the discussions awakened (?) during the present session of this Association. As small a meeting as this has been an era in the progress of our profession, and opened the doors to new fields of knowledge. Such victories of scientific research, particularly in the domain of special medicine, should and will outlive many of the sanguinary conflicts which have made history and changed the face of continents. Times are changing, and in no far off period it will not be the destroyer of mankind who will linger in the affections of the people, but those who do good to their fellowman, who lessen the harvest of death, and increase the chances of health and happiness.

The marvelous advances of the last few years in medicine and surgery, though less trumpeted, have equaled, if not surpassed, those of any department of science or invention, and especially is this true of laryngology, rhinology and otology. The

discoveries in this field of labor have gone far in alleviating suffering and prolonging life, and I am sure I commit no error when I state that among my auditors are some whose work has contributed to this happy result.

All the more, therefore, is your visit a pleasure to us, and I trust we will make it one to you by extending you a hearty old-time Virginia greeting, which begins with daylight, but does not set with the sun.

PRESENTATION OF CASES.

Dr. E. B. Dench, of New York, presented a case with the following history: Man of thirty-five years of age; eighteen months ago had an attack of acute otitis media, followed by mastoiditis two months after the begining of the attack. Was operated on the day following first visit. All of the process was found carious. The sinus was exposed, found to be filled with a small clot, which was turned out, but not entirely. Four days later, symptoms of sinus infection reappeared. The whole of the internal jugular vein, with its tributary branches, was removed from above the clavicle up to the jugular bulb. Recovery was uninterrupted.

Dr. J. A. Stucky presented a cockle-burr, removed from boy's bronchi a week before. Boy of twelve came, complaining of pain in one ear. Was cyanotic, breathing was difficult; was taken to the hospital, and on examination a cockle-burr was found in the right ventricular space. Larynx was very edematous. Failing to remove burr by mouth, an opening was made through the cricothyroid space. Breathing stopped as soon as opening was made; then he coughed and vomited freely, but no burr was found in the vomited matter. Breathing now became better, but as the edema was increasing a tracheotomy tube was inserted, and the boy put to bed. Twelve hours later, the right lung became clogged and developed a typical bronchitis. In (?) hours the tube was removed. Shortly after this the left lung showed signs of bronchitis, and the right began to clear. After thirty-six hours a violent coughing spell set in, and the burr was coughed up, and after a week's time the boy was sent home well. A small slough separated from the right side of the larynx four days later. The right cord is still a little rough.

Dr. Stucky thought that the burr had lodged near the bifurcation.

PAPER:

SENSORY NEUROSIS OF THE NOSE.

H. L. MYERS, M.D.

Mr. President and Gentlemen—I beg your indulgence for a short time in bringing before you a case of sensory neurosis of the nose, which, in my experience, presents several unusual features.

It has puzzled me not a little as to its proper diagnosis, and it is with the hope of receiving some assistance from this body that I have asked permission to report the case.

Miss R., æt. twenty-three years, white, consulted me for the first time April 30th for treatment of an acute suppuration of the right middle ear, following an attack of la grippe, which confined her to her bed for ten days. The drum membrane ruptured on the second day, with the usual relief of pain. The discharge continued rather longer than she expected, and she consulted me. Examination revealed a small rupture in posterior fold of membrane; a purulent discharge, not profuse; deafness marked, patient being unable to hear the watch on pressure; distressing tinnitus. She noticed, after the discharge began, that there was decided numbness of the right side of the face. It was almost insensible to a pin prick. There was no paresis of muscles. The numbness existed only in a mild degree when she came to me.

In addition to this ear trouble, which healed kindly under treatment, she compained of impairment of the sense of smell and taste, which she had noticed before the ear trouble began, but during the attack of la grippe. This persisted after the nasal symptoms, which usually accompany influenza, had subsided. I found that she could detect no odor, and was scarcely conscious of the odor of ammonia. There was really no trouble with taste, as she readily distinguished between sweet, bitter, sour, and salt. A slight thickening over the middle turbinates was reduced by chromic acid, thus freeing the upper air passages from obstruction. Faradic electricity was applied directly to the region of distribution of the olfactory nerves. This was afterward replaced by the galvanic current, applied in the same way. One-thirtieth

grain doses of strychnine sulphate were administered, t.i.d., for thirty days. At the end of this period the patient had made only sufficient progress to be enabled to occasionally detect an odor, as, for instance, a strawberry. She could taste the first berry, but no more. She could also by this time detect that many things had an odor, but they all smelled more or less alike. As she expressed it, "they smelled musty."

She received no further treatment after this for several months, as she was absent from the city on a summer outing.

On her return, examination revealed quite an improvement, as she could oft times get faintly the correct odor of an article and could occasionally taste something. One morning, in an abstracted way, she drew a spray of heliotrope blossom across her nostrils and was surprised that she detected perfectly this odor. On repeating the attempt, she failed to smell the flower. In fact, she says whenever she has been able to smell an article it has been presented to her unexpectedly. The electrical treatment was resumed, and, whether from this or natural causes, she has improved to the extent of being able to detect some odor to everything that has one; can detect escaping gas instantly, and can distinguish between flavors of food, though they don't taste as they should. She can also detect at any time the odor of a carnation. Now, this patient started with anosmia, of a seemingly typical type; her condition now resembles more parosmia. She is otherwise strong and healthy, and free from everything like hysteria. She has not recently made any progress toward recovery, and I would be grateful for expressions of opinion as to the form of trouble, its probable cause and prognosis, and any suggestions as to treatment.

DISCUSSION.

Dr. WRIGHT: During the past few years he has had many cases of anosmia during grip. The anosmia in all has been more or less complete, but has gradually recovered after varying degrees of parosmia. They have been mostly women, many of them hysterical. Some showed abnormal intranasal conditions. One he continued to treat for eighteen months. She was somewhat relieved by reduction of the swelling on the posterior border of the septum. The doctor finds that lesions here are especially liable to cause trouble in smelling and tasting. It is difficult to diagnose between cases of hysteria and real nerve weakness. Classes as hysterical all who claim loss of smell with no loss of taste. They were treated mainly by cautery and repeated applications of electricity. Most of them steadily grew better. He does not attribute the improvement to the electrical treatment.

Dr. STUCKY: Were these patients addicted to the use of the atomizer?

Dr. WRIGHT: It was not used.

Dr. STUCKY reports two cases after grip due to the persistent use of the atomizer, containing one-half per cent. solution of cocaine, with one per cent. resorcin. It brought on a neurasthenic condition of the nose and throat, which disappeared after the drugs were stopped.

Dr. KYLE reports similar cases after grip, due to exudative changes involving the peripheral nerves. Those in which the nutrition was good soon recovered from the infiltration following the grip; in those in whom nutrition was poor, the infiltration remained. He recommends the use of alteratives.

Dr. MEYERS asked about the prognosis.

Generally regarded as favorable.

PAPER:

CONCERNING THE ETIOLOGY OF ASTHMA.

JOHN DUNN, M.D.

Gentlemen: In my earlier studies of the nose and its diseases perhaps no one statment struck me more forcibly that that of Dr. Bosworth, to the effect that he had cured (and, I inferred, permanently) nineteen out of thirty-four cases of hay asthma and twenty-eight out of forty-six cases of perennial asthma by surgical treatment of the intranasal tissues. For eleven years I have watched carefully the results of intranasal surgery in every case of hay and perennial asthma which has come under my care, and while I have made friends, have afforded relief from many annoying symptoms to more than one or two people, and while immediately after different intranasal operations I have seen the asthmatic attacks disappear from varying lengths of time, the more closely these cases are observed the more convinced am I that it is neither hypertrophic rhinitis, nor nasal spurs, nor ethmoiditis with its polypi which cause asthma; and it has been my experience that, save in very rare instances, intranasal treatment cures neither hay nor perennial asthma. I have seen an asthmatic attack of great severity cut short in a few moments by the application of an eight per cent. solution of cocaine to the nasal mucous membrane, and the patient have no or only a slight recurrence for

weeks. In the especial case I have in mind, where this happened, the gentleman has perennial asthma, had been for a long time under the care of a distinguished member of this Society, has had asthma for many years and has it still. I have seen more cases where the intranasal application of cocaine has had little or no effect upon the severity of the asthmatic attack. I have under my care now a lady of sixty-five years, Mrs. T , who consulted me for nasal obstruction. Examination revealed complete blocking of the nasal cavities with polypi so numerous and large that they protruded from both anterior nares, and posteriorly from both sides of the nose into the nasopharynx. Their removal showed a large obstructive nasal spur, and extensive ethmoiditis. Her history is not uninteresting. Some six or seven years ago, while she was suffering greatly from rheumatism, her husband was paralyzed, and his brain injury resulted in a most distressing mental condition. While nursing him our patient, who was his constant attendant and often at night walked in her bare feet from room to room in her hurry to wait upon him, developed asthma of a severe type, which lasted for about three years, or until her husband's death. Shortly after his death she took some quack medicine for about ten days, and the asthma disappeared—nor has she had an attack since, now some three years—and yet there exists an obstructive septal spur and a most extensive ethmoiditis, with numerous polypi. Mrs. T., a sufferer from rheumatism, is of a gouty family and has tophi about the joints of her fingers. Or, take the case of Dr. G., aged fifty, who for thirty years or more has suffered intermittently from asthma. "When I am free from asthma I have rheumatism like the devil, and when I am free from rheumatism I have asthma;" his account of his case. With him any marked change of climate is sufficient to give him, for a shorter or longer period, cessation from his asthma. The time comes, however, when he has worn out his topographical welcome and his asthma returns. He has a moderate deviation of the bony septum and some turbinate hypertrophy. Dr. G. has consulted how many nasal specialists I know not, but certainly others besides myself. Mr. L., aged forty-eight, has a straight septum, and while there is some overfilling, especially of the blood-vessels of the inferior turbinates, there is no marked hypertrophy, and yet he suffers from perennial hay fever of such severity as to make life a burden. During the attacks his nasal mucous membrane assumes that watery, swollen, quasi-edematous, anemic appearance, which to the trained eye

tells the nature of the trouble. Mr. L. may be seemingly in good health; he will take his seat at the dinner-table, and there are certain forms of food which within a few moments after ingestion will bring on an attack of overfilling of the nasal membranes, hyper-secretion of watery mucus and sneezing, with sensations of great burning and itching of the intranasal tissues, nor will the attack subside for days. Mr. L. has consulted several of our nasal specialists, and has submitted to enough burning and cutting at the hands of more than one to have demonstrated to him its uselessness as a remedial agent in his own case. Mr. P., aged fifty-four, has suffered for fifteen or more years with autumnal hay fever in its severest form. Before he became a victim to this disease he had for months a form of diarrhea, for which his local physicians could do nothing. He visited one of the Virginia springs, seeking relief. While there he mentioned to one of the habitués the object of his visit, and was gratuitously informed that the waters would check the diarrhea, but that he would become a victim of hay fever. This lay prophet told true. The diarrhea ceased, but since then he has had hay fever every autumn save one, and this one his diarrhea returned and lasted throughout the hay fever season. Mr. P's. nasal cavities are, save when he is suffering from hay fever, normal in appearance. Last spring I was consulted by Mr. A., aged twenty-six, whose complaint was that whenever he rode or drove he would have a profuse discharge of irritating fluid from his nose; this would be followed by asthmatic wheezing in his chest and shortness of breath. These attacks would come on at irregular intervals, but could be precipitated at any time by taking a drive in the open air. There were constantly present uncomfortable sensations in the nose, examination of which revealed extensive ethmoiditis with several small polypi. The middle turbinates and such portion of the ethmoidal cells as was deemed advisable were removed. The result? Mr. A. passed the summer in greater comfort than he had known for years, so far as his nasal and asthmatic attacks were concerned, but he suffered from an obstinate form of diarrhea, characterized by the passage through the intestines of many forms of food apparently totally undigested. I have notes of more than one similar case. Mr. S., aged sixty-five, suffered from asthma until he reached middle age, when gout of the toe developed. He has never had another attack of asthma, but continues still to suffer with gout in no light form. And, lastly, Mrs. M., aged seventy-two, suffers at varying intervals and for varying lengths

of time with much discomfort, and at times considerable pain in the frontal sinuses; during these periods of discomfort there is a constant dripping of a clear, watery fluid from her nose. A course of salol will cause the pain to diminish and the secretion to cease, but at the same time it so lessens the urinary excretion that she fears to take it. Her fingers show gouty deposits. The above cases appear at first glance to have been snatched from a grab-bag of asthma notes and presented unconnectedly. It is not so. To me they all seem to teach clearly the lesson that neither "a neurotic condition," nor "some obscure atmospheric condition," nor "a diseased condition of the nasal mucous membrane," if we use the term diseased to mean turbinate hypertrophy or ethmoiditis with polypi; neither one nor all are essential for the production of asthma. To me the above cases, and not a few others similar in essentials, seem to show that many of the intranasal conditions found in asthma are due to a cause similar to the rheuratic and gouty attacks, the diarrheas and eczematous outbreaks and many other of the systemic disturbances which are found accompanying or alternating with the asthmatic attacks. Asthma cannot be due solely to ethmoiditis, for, if so, why does it not occur always as a result of ethmoiditis? Why in some cases do the asthmatic attacks disappear and permanently in the presence of ethmoiditis, untreated, unchanged, unchecked? Simple hypertrophy of the turbinated tissue cannot be looked upon as a cause of asthma, for were it so asthma would be the most common disease of mankind. The "general neurotic condition," as a *sine qua non* of asthma has always seemed to me the weak spot in Dr. Bosworth's teachings; for hay fever and asthma attack every known temperament. Nor can the "obscure atmospheric condition" be allowed a place as a cause. Its very obscurity forbids it. For some asthmatics this "obscure atmospheric condition" is present at all seasons of the year, at all hours, day or night. Let us look, for a moment, at some of the cases above mentioned. It is highly probable in the case of Mrs. M. that the intermittent attacks of pain in the frontal sinuses, with the resultant rhinorrhea, are due to gouty irritation of the mucous membrane of the frontal sinuses. (The intranasal tissues are practically normal.) If gouty irritation can produce pain and discomfort, with an excessive watery discharge from the mucous membrane of the frontal sinuses, there seems to me to be no reason why the gouty processes may not produce intense irritation of the mucous membranes of the nasal cavities. Mr. L. had asthma until gout developed, when

the asthma disappeared permanently. Dr. G. has rheumatism and asthma alternately. Mrs. T. had asthma; she now has gouty deposits in her fingers and never suffers from asthma. Mr. P. has hay fever each autumn save when he has an attack of chronic (probably gouty) diarrhea. In other cases, to be seen constantly in practice, asthma co-exists or alternates with some well-known disease in the same individual, and the patient's account of the exacerbations of each are always interesting.

But, gentlemen, I would not have you think I believe that disturbances of the intranasal tissues bear no causal relation to the production of asthma. Far from it, for in an experience of eleven years I have seen very few cases of asthma in which there did not exist visible intranasal conditions which I believed were directly responsible for the origination of the asthmatic attacks. If the retention in the blood of the products of tissue metabolism can produce rheumatism, gout, diarrhea, eczema, and various other diseases, can as time passes cause degeneration of the walls of the blood-vessels, should we consider it any wonder that these same products can by their irritating effect cause intranasal disturbance? This brings me to the point of my contention, and I lay no claim whatever to any originality. Asthma I believe to be in most cases a reflex trouble, caused by the irritating effect of the retained products of tissue metabolism upon the intranasal mucous membranes. The two chief intranasal visible conditions which tell of this irritation are, first, that watery, swollen, quasi-edematous, and, in old cases, anemic appearance of the turbinates and general nasal mucous membrane, due possibly to vasomotor paralysis, a condition accompanied by an abnormal secretion of watery mucus and much nasal discomfort. The second is ethmoiditis, with its resulting polypi. Both of these conditions are the result of the irritating effect of the retained products of tissue metabolism upon the nasal mucous membrane, and are of the nature of gout. Asthma is not a reflex of the swollen turbinates or of the ethmoiditis with its polypi, but of the intense irritation caused by the action on the mucous membrane of the metabolic products. This irritation may cause reflex asthma in a person whose nasal mucous membranes are, between the asthmatic attacks, perfectly healthly so far as can be judged by the naked eye. It may be so intense as to cause ethmoiditis, and thus beget nasal polypi. Hay fever is a direct expression of this irritation. The two diseases are thus closely connected, and not infrequently co-exist in the same individual. Many of you, gentlemen, have

doubtless wondered why I have not already used the terms uric acid and uricacidemia. I have not done so because I am not sure that uric acid is the only product of tissue metabolism which, when retained in the blood and forced into the tissues, is capable of producing irritating effects. That uric acid is the chief product in bringing about the disturbances under consideration I think not unlikely. If the view above taken be the correct one, then we can see at once that very few cases of asthma can be permanently cured by intranasal treatment of any kind. I do not say that intranasal surgery in cases of asthma with deflected septa, septal spurs, ethmoiditis with its polypi, etc., is not justifiable, but my experience has led me to belive that although surgical measures may, in these cases, afford, in many different ways, more or less relief to the patient, at the same time they are not to be looked upon, save in rare instances, as methods of effecting a permanent cure of asthma. Stated briefly, the object of this paper is to state that it seems to me that in most cases asthma is a reflex from irritation of the nasal mucous membranes, that the swollen turbinates and ethmoiditis, with its polypi, found in asthmatics are the visible results of this irritation; that the irritation is caused by the action on the nasal mucous membranes of the retained products of tissue metabolism; and, lastly, that this view places asthma causally in the same class of diseases with gout and epilepsy, the difference in the focus of irritation causing the difference in symptoms.

DISCUSSION.

Dr. PHILLIPS: Is surprised at Dr. Bosworth's statements in his books. Bosworth states cures of large numbers of asthma patients from the treatment of intranasal conditions. Wrote the book one year too soon; most of these cases had recurrent trouble. Relief was only temporary. Dr. Phillips is skeptical as to the intranasal cause of asthma. He feels that intranasal conditions are a result rather than a cause of asthma in most cases. Reported one case of laryngitis. The nose was found to be full of polyps. On removal of these the voice returned entirely. He regards rheumatism and gout as associated with asthma. As to the use of cocaine it is useful during the attack if one dares to use it; but he does not let the patient use it at home. Bosworth still does and claims that no cocaine habit has been formed. During the past two years he has used suprarenal capsule. Many cases are benefited. Uses it especially at night with the powder blower. In some cases suprarenal capsule caused severe pain and acute rhinitis. As to the influence of atmospheric conditions on asthma, we know very little. Dr. Phillips' home on the St. Law-

rence River, has been a favorite resort for asthmatic patients; yet cases developed there are relieved by being sent elsewhere.

Dr. WRIGHT feels that we have no satisfactory theory. He does not believe in intranasal conditions as the cause of asthma. If the nose be badly obstructed, removal of the obstruction improves the breathing, that is all. Last fall, operated on a boy whose pharynx was full of adenoids. They were thoroughly removed. The boy's asthmatic attacks usually began on the 12th of of August; up to the 15th of August he had no trouble, but on the 16th a letter came saying that he had just had a terrific attack. He mentions another patient from whom he removed adenoids for the relief of spasmodic asthma without effect. She has since married, has been repeatedly pregnant, and no asthma has developed since marriage.

PAPER:

CHRONIC EMPYEMA OF THE MAXILLARY SINUS: OPERATION AND TREATMENT.

J. A. STUCKY, M.D.

That the radical or conservative treatment of every case of chronic empyema of the maxillary antrum is a law unto itself goes without saying; but the chief object I have in presenting this topis for your consideration is not to mention symptomatology, etiology or methods of diagnosis; that these are thoroughly understood is assumed, but to particularly request that you bear the following points in mind in the discussion: (1) What, in the average case, is the best operation for cure of chronic suppuration of the maxillary sinus? (2) What is the best after treatment to maintain drainage and effectually prevent formation of granulation tissue?

Irregularities in size and shape of the maxillary sinus, inequality in the thickness of its bony walls, the possibility of encountering one or more bony partitions are important factors to be considered in the determination of the nature of the operation, and where best to enter the cavity. It has been conclusively shown by Cryer, of Philadelphia, and Talbott, of Chicago, that the anatomy as laid down in the text-book is unreliable so far as diseases of the nose and its accessory cavities are concerned. Especially is this true in regard to the maxillary cavity.

It is also generally accepted that diseased teeth do not cause

the majority of cases of infection of this sinus, but on the contrary the infection comes from above, either as a result of the damming up of the secretions in the middle meatus by nasal polypi, enlarged middle turbinates from ethmoidal or frontal suppurative disease. Frequently one or all of these are important factors in cause of chronic suppuration of maxillary antrum. Cryer believes "that it is through the common communication between the frontal sinuses, the ethmoid cells, and the maxillary sinus that infection is generally conveyed, recognizing at the same time that the posterior ethmoidal and sphenoidal cells, and the cells of the orbital process of the palate bone, can also infect the antrum by the resorption of the partitions between these cavities. Also, that more teeth are lost through disease of the antrum than there are cases in which the teeth are primarily diseased, causing infection of the antrum and associated cells."

My observations are in accord with these views. In many cases a diseased molar root is found penetrating the antrum, but in no case of chronic suppuration have I found the middle turbinate or ethmoid cells in a normal condition, and in no case was the patient relieved until the nasal cavity and its sinuses were placed in a healthy condition, or at least rid of suppurative trouble.

The indications, then, to be met in this disease are, first, remove the cause of the infection; second, secure and maintain free drainage. The nasal cavity is the first to receive attention. In every case a portion, at least, of the (anterior process) middle turbinate is removed with scissors and snare. This is done to avoid any possibility of interference with the hiatus semilunaris. Drainage through this must not be obstructed in the least. If the ethmoidal cells or frontal sinus be at fault, these are to be dealt with in the most thorough manner, and the entire nasal cavity placed in condition favoring normal respiration and drainage.

Having accomplished this, the nose is loosely packed with gauze, preparatory to entering the antrum. This precaution is taken to prevent hemorrhage and a possible reinfection in a fresh-cut surface. In a paper read before the Kentucky State Medical Society, in June, 1896, I advocated entering the antrum through the socket of one of the molar teeth. For the past two years I have discarded this method in favor of the one following. If there is a dead tooth or root penetrating the cavity, it is removed.

An incision is made at lower part of the canine fossa just above the alveolar process, and tissues carefully dissected back so

as to expose the entire fossa. This cavity is entered with a hand-drill or chisel, enlarged with Rongeur forceps until the finger can enter with ease. Granulations and polypi are removed with finger and curette, and partitions, if found, are broken down, so as to make one cavity. The sinus is then carefully inspected with the aid of a large ear speculum, in order that nothing escape which might prove a source of infection. The cavity is then packed with gauze. This first dressing is allowed to remain for twenty-four hours, then removed and the cavity washed with an antiseptic solution (boric acid). This is repeated daily for several days.

The question of maintaining patency of the opening and keeping up drainage has been the perplexing one. The metallic and hard rubber tubes are both irritating and uncomfortable. The soft tubes and gauze drainage allow the discharge to ooze constantly into the mouth, and are readily blocked up by food, hence are never clean. At a suggestion of Dr. C. R. Holmes, I have been using pulgs made of flexible dental rubber. After three to six days, when it is no longer necessary to pack the cavity, an impression is made of the opening with dental composition, and a plug made. This should fit accurately the canine fossa, and allow the cheek to cover it comfortably. It should enter the cavity about one-third to one-half inch, curved a little upward and backward. As soon as the composition is hardened sufficiently, it is removed, smoothed up, and given the dentist to model in plaster of paris, and a plug of vulcanized, flexible rubber made.

I exhibit for your inspection several of these plugs.

The advantages are, they are clean, easily removed, cause no irritation or inconvenience. I have cases that have been wearing plugs, such as described, for months with the greatest satisfaction. The duration of such cases is uncertain, but week and months are required, in some of them, to bring about a cure. When this is accomplished, the antrum has the appearance of being lined with a vascular fibrous membrane, with no evidence of granulation, or muco-purulent secretion. For keeping down exuberant granulations a solution of zinc chloride, used alternately with nitrate of silver or alcohol, has served me best. I am now trying, with satisfaction, a twenty to twenty-five-per-cent. solution of protargol.

DISCUSSION.

Dr. PHILLIPS: Diseases of the accessory sinuses are numerous of late because of grip. He regards acute inflammation of the

sinuses as common. They tend to recovery. Has seen many cases of acute antrum inflammation recover by local treatment. Only lately has it been shown that teeth are not the main cause. The tooth trouble is often the result of antrum trouble, and not the cause. As to operation, he prefers the route through the mouth, save in very chronic cases, in which he removes the inferior turbinate and makes one cavity of the antrum and nares. He has examined between one hundred and one hundred and fifty cases in the morgue. He finds that the size of the cavity varies greatly, though it is large as a rule. The lowest portion of the cavity is opposite the ridge of the second molar tooth. He opens above this tooth, on the ridge, and carries the opening forward to the canine fossa, making a hole large enough to inspect and clean the cavity thoroughly. In diagnosis it is often difficult to tell whether it is simply a disease of the antrum or whether the pus comes from above. Transillumination is of some help. Sickening tenderness on pressure over the floor of the orbit is suggestive of ethmoidal trouble. Watch the course of the pus carefully. Do not let the patient blow the nose before coming to the office. In operating, do not hurry. Be careful in curetting to remove only the diseased tissue. The mucous membrane here is so thin that it is easy to remove everything. As to treatment, he feels that we tend to treat these cases too long. Continued treatment keeps up the irritation. In the past five years he has used only gauze for draining and packing. After keeping an antrum packed for three or four weeks, all gauze is removed from the cavity and only enough gauze kept in the opening to keep food out until the opening can close.

Dr. KYLE has found that many or most of his antrum cases have been infected from the teeth. Calls attention to the varying size of the cavity, not always large. One he examined recently not one-quarter of an inch in diameter. (Remember that the upper part of the antrum is higher than a part of the floor of the orbit.) Pressure on the floor of the orbit with the finger elicits tenderness, and a sickening sensation if pressure be made over an abscess. Remember that darkness on transillumination may be due to thickened bone. Be cautious as to over-treatment. He never uses plugs; opens freely; curettes very thoroughly. When the mucous membrane of the antrum is in a granulating condition, it has practically lost its character as a mucous membrane and becomes only a connective tissue. To destroy the disease, you must remove all the diseased tissue. The genetic layer quickly disappears under granulations. If in doubt as to the presence of pus, pierce the antrum with trocar and canula above the canine fossa.

Dr. WRIGHT: Statistics. Diseases of the antrum are twice as frequent as all the other sinuses; then comes the sphenoidal, then the frontal and ethmoidal. Most cases not recovering after four or five weeks treatment are complicated by involvement of other

sinuses. Has opened an antrum and found a healthy mucosa, the pus having simply run down from above.

Dr. STUCKY does not use the plug in every case, only in very chronic ones. He curettes deeply, if at all. Carious teeth are often the cause in acute cases.

PAPER:

TWO CASES OF INTRACRANIAL INFECTION FOLLOWING MIDDLE EAR SUPPURATION

EDWARD B. DENCH, M.D.

While intracranial infection is by no means an infrequent complication of middle ear suppuration, it is usual for the pus collection to be located in the immediate vicinity of either the middle ear or mastoid. The present case is interesting, from the fact that the purulent focus was located at a considerable distance from the primary source of infection—that is, from the middle ear. The case is also of interest in that the avenue of intracranial infection was undoubtedly from the external surface of the skull inward, instead of resulting from the extension of the inflammatory process directly from the vault of the tympanum or from the mastoid itself.

The patient was a youth fifteen years of age. About six or eight weeks before I first saw him, he had entered the hospital suffering from an acute purulent inflammation of the middle ear. In addition to the purulent inflammation, there was marked tenderness over the mastoid; free drainage through the external auditory canal was secured, the ear was frequently irrigated with an antiseptic solution and the ice coil applied over the mastoid process. Under this treatment the mastoid tenderness entirely disappeared. The discharge diminished in quantity, and the patient left the hospital apparently much improved, and with no evidence of mastoid being involved, all these symptoms having entirely disappeared, under the local application of cold.

When I first saw the patient, there was a profuse discharge from the ear, considerable tenderness over the mastoid region, and over the skull behind the mastoid. The tissues over the mastoid process and posterior to this were also considerably swollen. Under ether the typical mastoid operation was performed by my house surgeon, Dr. Estabrook. The antrum contained very

little pus, and was smaller than normal. No pus was evacuated on incision of the soft parts, although the periosteum had been dissected from the skull for a distance of three inches behind the ear and the tissues overlying the bone were infiltrated. After the completion of the mastoid operation, the posterior flap was raised and the cavity left by the dissection of the superficial tissues from the bone very thoroughly curetted. In raising this flap the surface of the bone was found to be eroded for a distance of at least two and a half inches behind the posterior wall of the bony external auditory meatus. In using the curette upon this toughened surface, a drop of pus seemed to exude through the bone at the most posterior portion of the cavity. The incision was extended backward so as to expose the bone more clearly to view; a perforation through the skull was found about three inches behind the posterior margin of the bony canal. This opening was enlarged by means of the chisel and curette, thus opening the cranial cavity. Immediately beneath the perforation, an extradural abscess was found. The abscess cavity was about as large as a pigeon's egg and was shut off by the firm adhesion from the epidural space. The cavity was located in the posterior cranial fossa just above the tentorium. By the introduction of the finger, the pulsation of the lateral sinus could be easily felt on the lower wall of the abscess cavity. As the sinus seemed to be perfectly normal, it was not interfered with. The mastoid antrum was packed with a strip of iodoform gauze in the usual manner and a strip of gauze was also carried into the external auditory meatus. The mastoid wound was then shut off from the epidural abscess by means of iodoform gauze. The abscess cavity itself was then packed with a strip of iodoform gauze, and the usual external and antiseptic dressing applied. This dressing was not removed until the sixth day after the operation. The patient is at present doing exceedingly well, there having been no complications since the operation, and the temperature never rising above 99°.

An interesting feature in connection with this case is that the area of intracranial infection was located at a considerable distance from either the middle ear or the mastoid. The mastoid cells were but poorly developed and consequently intracranial infection through the posterior mastoid wall could not have occurred.

It seems most probable to me that at the time that the patient was first admitted to the hospital (that is, about six weeks or two

months before I saw him) there had been a burrowing of pus along the upper and posterior walls of the external canal and out upon the external surface of the mastoid. This external periostitis would account for the tenderness of which the patient complained. Under the local application of cold the tenderness disappeared. Owing to the separation of the periosteum from the external surface of the skull, a certain amount of infectious material remained in contact with the bony walls of the cranium. It was from this source, I think, that infection of the intracranial structures occurred, the inoculation taking place through the bony wall of the skull through the tributary veins which are rather richly distributed at this particular point.

The case is of interest from the fact that had not a thorough operation been done upon the mastoid, the intracranial infection might easily have been overlooked. It should be laid down as a cardinal rule in all cases where there is any separation of the periosteum from the underlying bone, that the entire bony surface exposed be most carefully investigated, as otherwise a condition such as was found in this case might be easily overlooked.

The second case is of interest from the fact that it demonstrates the necessity of early operation in many cases of what may appear to be simple mastoiditis. The patient was a man 28 years of age. When he first came under observation, there was a history of an acute purulent otitis of about two weeks duration. For four or five days before he came into my clinic, he had been suffering excruciating pain in the mastoid region. He had been admitted to one of our most prominent hospitals for incipient mastoiditis, but no operation had been performed. When I first saw him, the pain immediately behind the ear was intense, the parts were extremely tender, and there was slight edema of the superficial tissue; there was also a profuse purulent discharge from the ear. The surface of the mastoid was exposed by the ordinary incision and the cortex, which seemed rather firm, was removed beneath the chisel. A small sequestrum was found in the superficial mastoid cells. By means of the chisel and curette, free communication was made with the mastoid antrum and middle ear. The superficial mastoid cells were rather poorly developed, excepting at the top, where one or two large cells were found; these cells contained pus. The deeper the mastoid was entered, the more extensive the caries became until, when the internal table was reached, it was found to be very soft. The internal table was removed and the lateral sinus exposed. The sinus wall was some-

what thickened, but the vessel undoubtedly contained fluid blood in its upper portion, and in this region a distinct pulsation could be felt. Just at the knee of the sinus, however, the pulsation was doubtful. I decided, therefore, to open the venous canal, although at the time I expected to find it normal. On incising the wall of the vein, almost no hemorrhage occurred. I then introduced the curette downward toward the jugular bulb, and turned out a small clot. This procedure was almost immediately followed by the characteristic free hemorrhage from below; hemorrhage from the upper end of the sinus, however, was not free. The curette was then introduced in this direction, the remainder of the clot removed and free hemorrhage immediately followed. The usual dressing was applied, care being taken to separate the mastoid and the sinus bounds by means of firm gauze packing. The case was dressed for the first time on the seventh day; the parts were found to be perfectly clean and the patient has since made a perfect recovery.

Here again it would have been extremely easy to have overlooked the more serious intracranial lesion, had not the mastoid operation been of the most thorough and complete character. If there is one point in all aural surgery that should be emphasized more than another, it is the necessity of performing an absolutely complete operation in every case. Had the sinus thrombosis been overlooked, a fatal termination must necessarily have resulted. It may also be laid down as a rule, I believe, that where the surgeon has the least doubt as to whether the sinus is absolutely normal or not, that he is perfectly warranted in opening the sinus for exploratory purposes, provided such a procedure is carried on under the strictest antiseptic precautions. It is hardly necessary to say that the most thorough asepsis must be practiced if the sinus is to be opened; the purulent focus within the tympanum and mastoid must be thoroughly shut off by means of gauze packing before the incision of the sinus wall. The operative field must be thoroughly surrounded with antiseptic towels; that is either with dry sterilized towels, or with towels moistened in a 1 to 1000 solution of bichloride of mercury. The instruments previously used must be re-sterilized, and the hands of the operator and of his assistants must be cleansed. If then a normal sinus is entered, no fatal result can follow, and the life of the patient is not in the least degree imperiled. If on the other hand the technique be faulty in the slightest degree, the procedure must endanger the patient's life. Complete asepsis in all surgery is of primary im-

portance. If this is followed conscientiously, even the gravest operation may be undertaken by the surgeon with absolute safety.

DISCUSSION.

Dr. PHILLIPS reported a case in which pus perforated both tables of the skull and dura. In this case the ice coil was kept on too long. After 24 hours of cold application the tenderness had gone, but the purulent discharge of the ear kept up, whereas it should have lessened if the process was diminishing. As the tenderness had practically disappeared and there was no fever the ice coil was finally removed; but that night pain recurred and severe symptoms set in. In the morning the patient was semi-comatose, with a temperature of 105°, soon followed by coma and death. Autopsy showed a septo-meningitis. Pus had perforated both tables above and below the antrum and had pierced the dura without forming an epidural abscess.

Dr. WOODWARD: How long after commencement of acute otitis media before brain symptoms may develop?

Dr. DENCH: They may develop in twenty-four hours after the first trouble; because in some cases there is no bony separation between the vault of the tympanum and the brain.

Dr. WOODWARD: What is the chance of sinus of one side becoming infected by operation on sinus of the opposite side?

Dr. DENCH: None, if the operation is properly done.

In answer to Dr. Davidson's question Dr. Dench reported similar cases in which pus burrowed along the sheath of the vessel.

Dr. DENCH regarded that too long use of the ice coil may aggravate the case or even cause clotting of the sinus.

PAPER:

ENLARGED TURBINATES—SYPHILITIC IN ORIGIN.

JOHN F. WOODWARD, M.D.

The physical and pathological conditions exhibited in the nasal cavities, as results of inherited and acquired syphilis, have been thoroughly and accurately written up. I feel, however, that the recital of the histories of two cases, a little irregular in their nature, will not be untimely.

Cases of nasal syphilis are numerous, manifold in nature and often very obscure. They appear as erosions, with the classical clear cut edge, condylomata upon the floor of the nose, indurated chancres, spurs, ridges, exostoses, synechiae and turbinal enlargements.

It is to the latter that I wish to call your attention. Here it is that we fail to diagnose so often, until after nothing else will relieve. The germ theory does not help us, and symptomatology is very obscure. The treatment generally anticipates the cause, and the result is in doubt.

Having read, with considerable interest, the articles which appeared in the *August Annals* upon nasal syphilis, by Drs. Levy and Linhart, I wish to record the cases below.

Case I. In April, 1899, Miss E. V. consulted me to obtain relief from a chronic cold. Age 28, health perfect, except a chronic tendency to take cold. The physical condition showed no evidence of hereditary or acquired disease. On examining I found the ears, throat, postnasal space and left nostril in a healthy state, though there was a lack of the normal pinkish tinge to the mucous membrane generally. The right nostril was almost entirely blocked by an immensely enlarged inferior turbinate, from which oozed a copious flow of watery mucus. She had been told by several doctors that she had a cancer. Cocaine locally reduced the swelling sufficiently to pass a small probe between it and the septum.

There were no adhesions. The enlarged anterior end of the turbinate presented at the orifice, and was hard to touch. Subjectively she suffered intense neuralgia on the whole right side of her face. There was puffiness about the lids, and pain in

the right eye. Pain in the right upper jaw teeth and tenderness to the touch on the right side of the nose. Not believing it of a cancerous nature, after a few weeks of temporizing I snared off and curetted away, as well as I could judge, about half of the turbinate. Relief was only temporary, as the wound would not heal, and every two or three days flakes of a membranous nature would form as large as half a dollar. I put her on ten drop doses of Donovan's solution of Arsenic, and for twelve months did not see her. She came again, however, last April, to have a fragment of bone removed from the roof of her mouth. For the first time I knew what I was dealing with. The usual syphilitic treatment cured her in three months.

Case II. In June, 1897, Miss M. A. came to me to consult about an offensive odor, which she said always accompanied a head cold. Age 17, well developed and in perfect health. Had had tonsillitis of mild type, marginal blepharitis, and subject to head colds all her life. Had two sisters and a brother, all of whom were physically weak. I found right middle turbinate very much enlarged, hard and covered with a granular mass in its interior half oozing a bloody mucus. Neuralgia of the right face, and tenderness over the bridge of the nose were marked. On the posterior portion of the left nostril were seen several small greenish, offensive scabs. Thinking it a case of incipient atrophic rhinitis I treated it accordingly. She improved very rapidly, and later on moved to Baltimore. In the Fall of 1898 she consulted me the second time for the same trouble. This time I found the left nostril clean and healthy in appearance. The right middle turbinate was larger than formerly, and more malignant in its appearance. I questioned her father about his personal and family history; he was so evasive in his answer that I immediately put my patient upon anti-syphilitic treatment, also snared off and scraped away as much of the turbinate as I could. In two or three months she was practically well and has had no return of symptoms up to this date.

Note the cases were both females and hence more naturally misled me for a while. Also, that there was decided pain very similar in both cases.

The first was a case of acquired syphilis, and the second was hereditary, yet the manifestations were almost the same. Plain and complete stenosis were the most marked features.

If these cases do nothing else, they teach us to be more careful in diagnosis, and to refrain from calling every case of swollen turbinates exhibitions of rheumatic or lithemic diathesis.

THE NON-MYXOMATOUS CHARACTER OF NASAL POLYPI.

JONATHAN WRIGHT, M.D.

MR. CHAIRMAN AND GENTLEMEN: In accepting your invitation to present a short paper before this meeting, I have done so with the hope of saying more forcibly and emphatically some things which I have, until lately, supposed were too well known and too universally accepted by rhinologists for explicit reiteration. I refer to the necessity of regarding nasal polypi[1] as pendant tissue in the nose, which has assumed that shape because of the effusion of serum into it from the blood-vessels. I had supposed that no one now used the word myxomatous in connection with these growths except in a Pickwickian sense.

It is of small consequence what name is attached to any phenomenon of nature, so long as it does not lead to confusion of thought. We all use the word adenoid, and we all know exactly what is meant by it, although the etymology of the word is very far from clearly indicating the histological structure of the anatomical locality of its occurrence. With the mistaken use of the word myxoma, however, there appears still to linger a mistaken conception of the condition to which it refers in the nose. Many very competent rhinologists, and even some familiar with histological work, conceive of this condition of the nasal mucosa as a new growth of tissue, a poliferation of embryonal branching cells in a homogeneous mucoid fluid of a different chemical and tinctorial reaction from ordinary serum with a litle mucin in it. Now such is not the case. While in the fluid of a polyp there is some mucin derived from glandular structure the polyp may contain, while here and there by careful focusing an occasional embryonal new connective-tissue cell may be seen, there is little or no new formation of tissue, but on the contrary a separation of the fibers of the pre-existing subepithelial stroma by serous

[1]It is hardly necessary to say that I here refer to the ordinary gelatinous polyp, and that I am aware that the word polyp is strictly only referable to external conformation and not to internal structure. What I have to say refers also as well to the so-called polypoid degeneration in the nose.

effusion. In not a few cases these stroma fibers are so scanty or the effusion of serum is so directly under the epithelium that the coagulated fibrin threads form the sole framework of the tumor holding a few leucocytes in their meshes. I shall not go further than this into the histology of the subject. I have elsewhere done so exhaustively. As for the histology of the so-called true myxoma, that may be found in all the text-books on pathology. In not one of them will you find any drawing illustrative of their structure, which has been made from an intranasal growth, though nasal polypi occur more frequently than all myxomata of all other localities put together—perhaps more frequently than all other benign tumors put together, Zuckerkandl asserting that they are to be found once in every eight or nine bodies on the post-mortem table. Surely if real myxoma occurs in the nose, one typical enough for text-book illustration ought to be found in a place where they are apparently so common rather than elsewhere, being in all places exceedingly rare, according to Virchow.

In the few minutes which are allotted to me, I am going to review hastily the salient historical points in this matter, so that from another standpoint than the one from which I have hitherto spoken of the subject there will remain no doubt as to my assertion that a very pernicious error has crept into the common conception of these growths.

I need only mention that polypus is a term meaning many feet, used by Hippocrates ("De Morbis," ii.) to designate five kinds of morbid intranasal states, only one or two of which would now be called by that name. The first feeble attempt at pathological differentiation is to be noted in Galen, who speaks of nasal growths thus ("Definitiones," No. 370): "Sarcoma is the unnatural growth of flesh in the nostrils, and a polyp is a kind of sarcoma. A sarcoma differs from a polyp in size and structure." It is plain, therefore, that Galen's idea was that of a new growth of tissue. It is unnecessary to follow exhaustively the various interpretations of this Galenic pathology throughout ancient medical history. Suffice it to say that the Arabians described a form of polyp in the nose which they called a hemorrhoid, considering it analogus to the vascular tumors at the other end of the alimentary canal. We recognize in this, of course, our vascular hypertrophy. When the pre-Renaissance physicians translated the Arabian works into execrable mediæval Latin, polypus was frequently rendered scorpio, because, I presume, that was the kind of a many-footed animal with which they were most familiar.

It is not until the last years of the seventeenth century that much advance may be noted over the pathology of Galen. Dionis,[1] a French surgeon whose work was published in 1707, says—and the statement was probably not original with him—it is proper to make a distinction between the two kinds of polypi. One is an excrescence formed by the engorgement of the glands which line the walls of the pituitary membrane, and the other is the "extension of this membrane gradually elongated." About this time Boerhaave could account for the formation of polypus only by supposing that "the nasal passages and the nasal mucus membrane become clogged with mucus and cannot discharge the humors contained in it." To add a touch of humor to this arid narration, it may be noted that Juncker,[2] a fluent and distinguished medical writer, in 1721 insisted that, according as the moon fills or wanes, the nasal polyp increases or diminishes in size. Without discussing astrological influence, we may see that the conception of the polyp had thus early changed to that of a water-logged membrane. Gorter,[3] in 1742, embodies the idea more clearly thus: "It seems sufficiently evident that the pituitary membrane is separated from the bone, often carious, in the cavity of the nostrils, so that it makes a pendulous sac, either simple or multiple, according as this membrane is separated from one or more depressions of the small bones, which sacs swell with secretions collected in cellular lamellæ of the membrane." It is unnecessary to quote from Morgagni,[4] who published his great work twenty years later, in order to show that his conception of the structure of the edematous polypus of the nose was the same.

We may take a leap across a hundred years to the remarks of John Watson, surgeon to the New York Hospital, who, in 1842, published a paper called "An Inquiry into the Pathology and Treatment of Polypus Tumors of the Nasal Fossæ."[5] "Soft polypi . . . arise from obstruction or obliteration of the ducts of the muciparous follicles and consequent retention and accumulation of the mucus within these; they lead to thickening, consolidation or infiltration of the mucous membrane and subjacent cellular tissue; they acquire their pendulous position and pedunculated attachment by the yielding and growth of the tissues enveloping the mucous accumulation, and by the naturally

[1]Dionis: "Cours d'Opérations de Chirurgie."
[2]Juncker: "Conspectus Chirurgiæ."
[3]Gorter: "Chirurgia Repurgata."
[4]Morgagni: "De Sedibus et Causis Morborum," 1762.
[5]Am. Journ. of the Med. Sciences, 1842, n. s., iii., p. 325.

loose attachment of the pituitary membrane here to the subjacent parts." He drew his ideas from Chelius' "Handbuch der Chirurgie,"[1] first published shortly before this, in which it is asserted that they arise as edematous swellings of the separate folds of the mucous membrane hypertrophies together with the submucous tissue at certain localities.[2] Thus far, since the disappearance of the Galenic pathology, there has been nothing said in regard to the proliferation of tissue, and it is evident that the common-sense view of the pathogenesis of nasal polypi prevailed in this country as well as abroad in the earlier years of the past century.

On referring to an early (1854) American edition of Paget's "Surgical Pathology," we find he classes nasal polypi among the fibro-cellular tumors (p. 386), and in this class he also puts those growths shortly afterward described by Virchow under the name of myxoma. All modern pathological nomenclature and classification dates back to the "Morbid Tumors" of Virchow, who, after the vicissitudes of more than fifty years on the stormy German ocean of pathology, may still be felicitated on having the clearest head in Europe.[3] In the "Krankhafte Geschwülste" (Ed. 1863, p. 417), having previously described myxoma in other publications, he dwells upon the relationship it bears to the retrograde metamorphosis of fatty tumors and of fat tissue, being frequently, therefore, found in connection with lipomata, a kind of tumor, so far as I know, never observed in the nose. He distinctly states that myxoma "in adults is relatively infrequent, even in the atrophic metamorphosis of fat tissue in the mucous membranes." It is not the place here to enter into a discussion if Virchow was right in setting up this class of growth as separate heterogeneous tissue proliferation. It may be that myxoma is only a variety of connective-tissue proliferation infiltrated with serous exudate.[4] I am not able to speak as to that. What I desire to insist upon is that the ordinary nasal polyp is not essentially a proliferation of embryonal tissue or of any other kind of tissue, nor is it a metamorphosis of tissue. I need only refer in passing to the remark-

[1] P. 530, seventh edition, 1852.

[2] I have not been able to see the original of Frerichs' dissertation "de Polyporum Structura Penitore," 1843, but he is said to have first pointed out that the epithelium covering nasal polypi was the same as that of the surrounding mucosa (Heymann's "Handbuch").

[3] See his late address at the Medical Congress in Paris, Virchow's Archiv, Bd. 162, Hft. i.

[4] In his address referred to above, he remarks incidentally as to this matter: "Es ist ein blosses Spiel mit Worten, wenn man junge pathologische Zellen und Gewebe embryonale nennt." Some account of the question of the doubt as to Virchow's classification of myxoma may be

able mistake made by Billroth,[1] in ascribing the structure usually found in rectal polypi to those found in the nasal cavity. He says he examined twenty cases of nasal polypi, and they were nearly all adenomatous in structure. This, of course, we know is wrong; they frequently contain no glandular structure at all, and never, in the ordinary polyp, are the glands more abundant than in the normal mucosa.

It needs only a reference to a few of the modern text-books on pathology to show that the definition of Virchow, in spite of much well-grounded criticism, is still universally accepted, and yet in not a few of them has crept the idea that the structure of the nasal polyp conforms to it. Billroth,[2] Cornil and Ranvier (1884) follow him explicitly. Birch-Hirschfeld (1887) speaks of nasal polypi as soft fibromata or myxofibromata (Vol. II., p. 381) but evidently he had no experience of his own with these growths, because in his description of myxoma (Vol. I., p. 151) he describes them in the sense of the others. He misquotes Hopmann, who, as we shall see presently, directly repudiates the idea of myoxoma of the nose. Weichselbaum (1892) gives a characteristic woodcut and the usual description of true myxoma. Ziegler (Ed. 1895) says that nasal polypi are made up of edematous connective tissue and mucous tissue, and must, therefore, be ranked among the fibromata and myxomata (Vol. II., p. 625), but he differs in no way from other pathologists in his description of the latter (Vol. I., p. 397), which are always combined, he says, with the histological forms of other tumors. Delafield and Prudden, in the last edition of their "Pathological Anatomy," state that it is frequently difficult to distinguish between the two; but in the illustration they give of the structure of a mucous polyp of the nose, there is no resemblance to the picture they give under a higher amplification as typical of myxoma.

Evidently, therefore, while the pathologists are united enough as to the characteristics of myxoma, they have accepted the authority of others as to the occurrence of it in the nose.

When we attempt to find who was responsible for the introduction of the term into nasal pathology, we are baffled by the apparent insidiousness of the process. It seems to have crept in through its use by writers who were either unfamiliar with the myxoma of Virchow or else unfamiliar with the histological de-

readily found in Councilman's article on "Myxoma" in Wood's "Reference Handbook of the Medical Sciences."

[1] "Ueber den Bau der Schleimpolypen," 1854.

[2] "Surgical Pathology," 1882.

tails and the pathogenesis of nasal palypi. Too frequently it has been indiscriminately used by writers unfamiliar with both.

The first mention of a myxoma occurring in the nose which I have been able to find is a report by S. W. Gross, in 1871.[1] We find here the myxomatous error in full bloom.

A glance at the text-books on the nose, which began to appear first a quarter of a century ago, convinces one that the term if not the conception of Virchow was well established in the literature of the subject. Michel, indeed, who published in 1876 the first[2] extended work of modern date on the disease of the nasal cavity, does not, so far as I can see from the translation of Shurley, speak of the polypi as myxomatous, and his conception of their etiology and pathogenesis does not coincide with the view of their being a new growth of tissue. Cohen, whose work first appeared in 1879, accepted the classification of myxoma. Stoerk, in 1880, did not use the word in connection with them, but in Bosworth's first edition, in 1881, they are so referred to. Zuckerkandl[3] very cuciously fell into the serious error of Billroth, quoting him with assent in saying they are adenomatous, but he makes no reference to them as myxomatous. Nothwithstanding the great value of Zuckerkandl's early work (1882) in intranasal pathology, his histology was lamentably deficient—a criticism which his later edition, in 1893, cannot be said entirely to escape, although he modifies his views somewhat as to the adenomatous character of nasal polypi. Beverley Robinson, in his treatise on "Nasal Catarrh," the second edition of which appeared in 1885, refers to nasal polypi as myxomatous. Morell Mackenzie, whose work still remains, after fifteen years, the most indispensable of all the laryngologist's library, begins his chapter on nasal polypi by saying they are new formations nearly always of a myxomatous character.[4] I will not pursue text-book literature into more recent time. Suffice it to say that in nearly all of the special works on the nose this error in nomenclature, if not in conception, still exists.

It is to Hopmann we are indebted for the first serious attempt to dispel it.[5] In 1885 he refuted not only the mistake of Billroth

[1]Vide Trans. Path. Soc. of Philadelphia, 1874, p. 219.

[2]Deschenups in 1804 published a treatise on the "Diseases of the Nasal Cavities."

[3]"Normale und pathologische Anatomie der Nasenhöhle," edition 1882, p. 76.

[4]Am. ed., 1884, p. 245.

[5]Monatschrift für Ohrenheilkunde, 1885, June, p. 161 It is less clearly combated in his paper in Virchow's Archiv, 1883, No. 93, p. 213.

as to their adenomatous nature, but, quoting from the German translation of Mackenzie's book, he denied the latter's assertion as to the myxomatous character of nasal polypi. They are, he asserted, to be looked upon as soft, edematous fibromata. I have to object in this definition only to the use of the word fibroma, which would indicate a preponderating new growth of fibrous tissue, a condition which does not obtain in the ordinary nasal polyp. While the amount of fibrous tissue varies between *nil* and a condition which might well be given the name of fibroma, the vast majority of polyps consists simply of the normal amount of loose areolar tissue infiltrated and stretched with serous exudate. After I had published,[1] in 1893, a paper on the structure of nasal polypi, being then unfamiliar with the literature of the subject, I received a letter from Chiari, who drew my attention to the fact that in 1887,[2] "on the ground of a histological examination of twenty-three nasal polypi, polypoid hypertrophies, and papillomata, I came to the conclusion that also in nasal polypi it was only a matter of serous infiltration of the hypertrophy of the mucosa." In many subsequent papers abroad this view has, I think, been incontrovertibly established—most conclusively, I think, by Hajek[3]—and it has been urged in this country by Swain,[4] John Mackenzie,[5] and others.

This return to the former conception of the nasal polyp is the only possible way, and is necessarily a preliminary to the understanding of nearly all the intranasal morbid processes. In numerous publications I have based many observations on this view of it, as have other workers in the same field. Nevertheless, in many publications abroad as well as in America, nasal polypi are still spoken of as myxomatous.[6] It seems, therefore, that the error amounts to more than a simple unfortunate phraseology.

I am well aware that this same mistake has been made, and the same confusion exists in the pathology of other regions of the body—that myxo is applied to a vast number of tumors which are not myxomatous at all, but simply edematous. I do not know,

[1] New York Medical Journal, November 4, 1893.

[2] "Erfahrungen auf dem Gebiete der Hals-und Nasenkrankheiten."

[3] Arch. f. Lar., 1896, Bd. iv., Hft. 3.

[4] "Nasal and Other Polypi," New York Med. Journ., March 12, 1898.

[5] "Pathological Anatomy of Ethmoid Disease," New York Med. Journ., 1897, p. 107.

[6] The most recent paper dealing with this subject exhaustively is that of Cordes (Arch. f. Lar., Bd. xi., Hft. 2). There is very little to be found in it which has not been stated previously by other observers, but it is a very satisfactory confirmation of much work done by others, the publications of which are scattered through rhinological literature.

however, that it has called such a halt elsewhere to the understanding of pathological processes as it has in the nose. At any rate, with this I am not here concerned. My object in this paper has been to do what I can toward banishing this benumbing idea from nasal pathology, for it is there especially that inflammatory and other pathological changes consist of, or are complicated with, this serous effusion.

DISCUSSION.

Dr. KYLE has examined over a hundred specimens. Does not consider edematous the proper term for nasal polyp. In the same nose we may find many forms and shapes and kinds. The subject is still rather confused. In the same nose he has found as many as a half-dozen different types, yet all seem to spring from the same source. In some cases he has removed part of the bone, in order to get the tumor intact. In these cases there is no mucosa on the pedicle, while it does exist on the body of the polyp.

Dr. WRIGHT is now making microscopic investigations of the nasal polyp. Has lately been studying the mucous membrane from a bull's nose. Weigert's stain he very beautifully differentiates the elastic fibers surrounding the sinuses. Function? Present in the inferior turbinate, but not in the middle. The absence of this elastic material in the stroma of the mucosa of the middle turbinate allows the formation of polypi. An examination of the edematous masses from the inferior turbinate shows absence in these areas of elastic fibers. It is still uncertain whether there is any unstriped muscle fiber in the mucous membrane of the nose.

PAPER:

BRAIN ABSCESS COMPLICATING CHRONIC PURULENT OTITIS MEDIA, OPERATION, RECOVERY—REPORT OF A CASE.

JAMES F. M'KERNON, M.D.

The following case is not reported on account of its presenting an unusual array of symptoms, but rather to show the fallacy of doing an incomplete operation on the mastoid when we have a collection of pus in this structure.

History.—J. H. T., a boy seven years of age, was brought to my clinic, at the New York Post-Graduate Medical School and Hospital, on October 9, 1900.

His mother, who accompanied him, gave the following history. He had had measles three years before, followed in a few days by earache on both sides; on the fourth day after the pain began, the left ear began discharging and continued to discharge at intervals for the next two years.

Ten months before coming under observation, there was a very profuse discharge of pus from the left ear, accompanied with severe pains in the ear and over the mastoid process of that side. A week after this, a large swelling about the size of a hen's egg developed behind the ear; at the time of the swelling behind the ear, the discharge ceased from the external auditory canal.

This boggy mass behind the ear was incised by the physician in attendance, who made the ordinary Wilde's incision through the soft tissues; this relieved the child, but left a discharge coming through the opening for several months, which opening finally closed; at the same time the discharge ceased running from the posterior opening, the ear stopped discharging also; two weeks prior to coming under observation, earache on that side began again. This was followed in two days by a free discharge of pus from the external auditory canal. Three days later, a swelling developed over the entire mastoid region, which swelling has continued since. For over a week the boy had had attacks of vomiting, and complained of intense pain in the head on that side; had been delirious at night, and seemed dull and inclined to sleep.

Physical examination disclosed a thick, greenish, purulent dis-

charge coming from the external auditory meatus of the left side; upon wiping this discharge away, the canal walls were seen to lie in apposition, so as to shut off any further view of the parts beyond. The mastoid region was swollen and edematous, and one inch posterior to the auricular attachment a long scar was seen extending vertically over the mastoid process; through the lower portion of this scar there was a free discharge of pus, and upon passing a probe through the opening, from which the discharge came, softened bone was encountered.

There was some swelling around the eye of the affected side, as well as in the soft tissues in the temporal region of the same side.

The temperature was 98° F.; pulse 52, and respiration 14. While undergoing the examination, the boy seemed dull and sleepy and vomited a few drams of clear-colored fluid, and could not be made to answer a word that was put to him. Pressure over the mastoid seemed to give him no disturbance, nor did percussion on that side of the head.

An immediate operation was advised and accepted, and, two hours later, he was taken to the operating-room.

Operation.—Ether was administered, the usual mastoid incision made, and the whole external cortex found softened, with here and there a perforation through which pus was escaping; the whole mastoid process was removed by means of the curette and rongeur. The sinus was exposed at the bend for over an inch, as in this region the inner table was softened and necrotic.

In using a small curette to clear out the aditus-ad-antrum, a few drops of pus would appear each time after the use of the instrument.

The incision in the soft parts was extended forward, and a flap turned upward over the temporal region and an exposure made directly over the roof of the tympanum. A perforation was found through the tegumen, together with a sinus leading upward and inward to the middle fossa; the opening in the dura was of sufficient size to admit the passage of a director.

This opening was enlarged sufficiently to admit the passage of the index finger, which was introduced into the abscess cavity and all broken-down tissue loosened; the cavity was then syringed with a hot saline solution and considerable pus, broken-down brain substance and débris were removed; the abscess cavity was then packed with plain sterile gauze, moistened in the saline solution, and rolled so as to make a wick, in equal parts of boric acid and

iodoform. The packing was not placed in firmly, but rather loosely, so as to allow a collapse of the abscess walls.

The mastoid wound was packed in the usual way, and the dressing allowed to remain in place for four days, when a new dressing was applied, but the cavity in the brain was not again irrigated, as the only discharge coming from it was broken-down brain substance, with a slight amount of serum, but no pus.

The boy made an uneventful recovery, his temperature being no higher than 99.6° F. during the whole period of his convalescence. There was a gradual increase in the pulse rate from the first, so that at the end of thirty-six hours his pulse was 84; the mental condition began to improve, and, save for a slight aphasia which was present for one week, his convalescence was much the same as that of the usual mastoid case. He was discharged and sent home eighteen days after the operation, returning every third day for dressing. At the present writing, the wound has entirely healed, the boy's general condition is vastly improved, and he is attending to his school duties.

Had a radical operation upon the mastoid been done at the time when the Wilde's incision was made, I feel quite sure that no intracranial involvement would have followed, and this patient would not have been subjected to the danger which he afterward underwent. I believe, from my experience in this work, that when, upon physical examination, a Wilde's incision seems called for, there is a still more imperative call to go further, evacuate the pus in the mastoid, and prevent the patient from the possibility of a subsequent infection by an extension to other structures adjacent.

PROCEEDINGS OF MEETING

OF

EASTERN SECTION

HELD IN BUFFALO, N. Y., JUNE 22, 1901.

ADDRESS OF THE CHAIRMAN.

W. SCOTT RENNER, M.D.

GENTLEMEN: It is to me a great honor and a great pleasure to welcome the fellows of the American Laryngological, Rhinological and Otological Society to this meeting of the Eastern Section. I am proud of the opportunity to present you with something in addition to your scientific work, valuable as it may be. The importance of the subjects which may be discussed by this Society are well illustrated by the programme which you have so kindly agreed to present at this time. We feel that we are especially fortunate in having papers by fellows from the different sections, and from Canada. Besides this, you have come here at a time when Buffalo is able to astonish you with the pleasure of seeing our great Rainbow City—the Pan-American Exposition.

This meeting should have been held during the winter months, when Buffalo's climate is not always the most inviting, but we can be thankful to the generosity of our Council, who have allowed it to be postponed to the beginning of another year, and at a time when Buffalo can present more than herself. Our weather is always pleasant and cool in summer.

In addition to the great Pan-American Exposition, we have in our immediate neighborhood the greatest of natural wonders—the Falls of Niagara; and, not far off, in northern New York, are the Adirondacks, the Lake Champlain region, and, just beyond them, the Thousand Islands. I trust that those who have come long distances will profit by these opportunities.

When so instructive a programme is awaiting your approval and discussion, and the many attractions of the Exposition are so near at hand, it would be presumptuous on my part to detain

you with a lengthy address on subjects with which you are all familiar.

Many strides have been made in recent years in the specialties which we represent, and which are rapidly, of necessity, becoming one. In addition to this, we are rapidly acquiring a thorough knowledge of the pathology and symptoms, and a skill in the treatment of the brain complications of suppurative diseases of the middle ear and of the accessory sinuses of the nose. The importance of such knowledge and skill to us is demonstrated by the fact that so large a percentage of the published cases of brain abscess, meningitis, and sinus thrombosis, etc., are complications of one of the most common conditions which we treat, and we are liable to meet these complications unexpectedly in the midst of an operation such as the radical operation upon the mastoid.

These few remarks serve to illustrate the wider range of our specialty, and the amount of technical skill which must be acquired for the practice of a specialty, which, but a few years ago, was sneered at as quackery by both the physician and surgeon. To-day many otologists, and a good proportion of them members of this society, vie with the most distinguished general surgeons in the operative technic of brain surgery, especially in the treatment of brain abscess and allied conditions. Ours is destined to be the greatest, and probably the only, specialty in surgery, ophthalmology excepted.

Gentlemen, I again welcome you here, and trust that this will be a successful meeting from a scientific standpoint; and hope that Buffalo and the Pan-American will repay you in the pleasure which they give you for the long journey which you have made at this time, when traveling is so unpleasant.

I now have the pleasure of extending to all the members an invitation to lunch with me at the Saturn Club, immediately after this session, where you will meet several friends of mine, members of the local profession.

Gentlemen, I now have the honor to declare the meeting of the Eastern Section of this Association open.

PAPER:

THE DIAGNOSIS OF PRIMARY LARYNGEAL TUBERCULOSIS.

BY P. S. DONNELLAN, M.D.

The occurrence of primary laryngeal tuberculosis has been denied by many authorities who regard the laryngeal involvement as secondary to the pulmonary form of the disease in every instance. My own limited experience and a search of the literature I could obtain on the subject lead me to conclude that its existence is not so rare as is generally supposed, and is quite explicable from a pathologic standpoint. The following review of the literature is of interest:

One of the earliest writers to call attention to primary laryngeal tuberculosis was J. Solis Cohen[1], who reported three cases occurring in adults. In none was there any hereditary history of tuberculosis, and no pulmonary involvement occurred until from six to eighteen weeks later. In each case the first symptoms were those of acute laryngitis. G. H. Mackenzie,[2] Angelot,[3] and Rebaine[4] have reported similar cases. B. Frankel[5] described a case that was in all probability one of primary laryngeal tuberculosis. A man, aged thirty-one years, was observed by him for five years, and tubercle bacilli discovered in his sputum. These microorganisms must have come from his larynx, as (on post-mortem) deep ulcerations were found in the arytenoids and cords, while the lungs were found entirely free from any evidence of the disease. McDonagh[6] records a case in a man, aged thirty-three, who presented himself for the treatment of hoarseness, which began six months previously, while he was in New York, where he was examined by Professors Loomis, Delafield, and others, and by whom he was told he had "ulceration of his throat," but no tuberculosis. When examined by McDonagh, his lungs were normal. His larynx showed ulceration of both vocal cords and of the interarytenoid space. His sputum contained tubercle bacilli. Family history was negative as regards tuberculosis, and syphilis was denied. Trifiletti[7] describes a case of primary tuberculosis of the larynx without pulmonary involvement, in a young woman,

aged twenty-one years. The pulmonary diagnosis was confirmed by Professor Massei. Dehio[8] reports a man, aged forty years, with sound lungs and good family history, as having a circumscribed tuberculous tumor on the left ventricular band. The growth, which was removed by laryngofissure, was found microscopically to consist of miliary tubercles. Avelles,[9] Palazzola[10] and Germain-Sée[11] have recorded cases of undoubted primary laryngeal tuberculosis. Cadier[12] reports 100 cases in which the disease first showed itself in the larynx. Of these he had observed sixty for a considerable period of time. Aronsohn[13] recently published the histories of two interesting cases—both adult males—the first with primary laryngeal tuberculosis, in which the lung involvement did not take place until four years later. The second, a dentist, aged thirty years, with a tuberculous family history. Disease began in December, 1891, with laryngeal sumptoms—no bacilli in sputum—lungs normal. Shrotter found deep ulcerations of the post-pharyngeal wall, which were cured by local treatment. In October, 1892, recurrence. Case diagnosed by Guggenheim, of Paris, as tuberculosis, with edema of larynx—tracheotomy. Later seen by Schrotter and diagnosis confirmed. The lungs were pronounced healthy by Nothnagel.

Anroy[14] has reported the following case: Patient thirty-seven years, sound lungs and good general health; had diffuse hyperemia of vocal cords, and small ulcerations upon right swollen vocal cord. Microscopic examination of part curetted from larynx confirmed diagnosis of tuberculosis.

Moritz Schmidt[15] also reports a case, that of an officer who developed on left vocal cord hyperemia with steplike (*treppenartig*) appearing infiltration, without any disease of the lungs. Antisyphilitic treatment was without effect. Local treatment resulted in cure. After two years, recurrence on right vocal cord; local treatment; cure. Microscopic demonstration of tubercle bacilli in particles removed. After a year, hemoptysis and disease of right apex of lung.

Josephson[16] reports this case: Peasant, aged seventeen years, of healthy family; hoarse last four years. Vocal cords thickened, and covered with numerous excrescences; otherwise no alteration in any organ. Almost complete recovery followed local treatment. After two years, decided habitus phthisicus. On postlaryngeal wall, large ulcer; infiltration of right vocal cord; edematous swelling of right plica arytepiglottica. Lungs: Right

apex, short percussion note, bronchial breathing; left, cavernous signs in upper lobe. According to microscopic examination (Nauwerk) of piece excised two years previously, it was a typical tuberculous growth.

Rault[17] had a case in which, on post-mortem, there was found in the lung only some recent granulation in one apex, while the larynx was the seat of an old diffuse tuberculous inflammation and numerous superficial ulcers.

Guggenheim and Tissier[18] report the case of a young man who had a tumor of uneven surface, seated on the base of the epiglottis, and entirely filling out the larynx. Tracheotomy had to be done on account of dyspnea and danger of suffocation. The lungs were apparently unaffected. The laryngeal tumor was removed by forceps, and found to be tuberculous. Two years after the tracheotomy, the general health was quite satisfactory.

Clark[19] reports the following case: Woman, aged thirty-one; no hereditary taint; first came under treatment in May, 1893; was generally healthy until four years previously (May, 1889), at which time she contracted a severe cold from exposure; the cold was accompanied by laryngitis, and patient ever since was hoarse. For two years a tumor was known to exist in the larynx, and a number of unsuccessful attempts made at removal through the mouth, the patient being unwilling to submit to a thyrotomy. When seen, in 1893, the patient was very hoarse, had great difficulty in speaking, and attacks of suffocation. Laryngoscopic examination revealed a generally smooth sessile growth, having a small depression, covered with mucous membrane, somewhat redder than its surroundings. It arose from the left ventricular band, and during respiration entirely hid the left cord and part of the right. The larynx was normal, with the exception of a slight injection of vocal cords. Tumor was removed, and wound healed quickly. October, 1894, patient's health was excellent. A thorough examination of the lungs was negative; tumor proved, on microscopic examination, to be tuberculous.

Pluder,[20] Panzer[21], and Bonfiglio,[22] have also recorded interesting cases of primary laryngeal tuberculosis, for the details of which the reader is referred to their original papers.

The diagnosis of primary laryngeal tuberculosis is made by obtaining an accurate history of the case; by the symptoms of the disease as related by the patient; by the systematic use of the clinical thermometer; by the appearance of the larynx as seen by the laryngoscope, and by the presence in the sputum of the

tubercle bacilli of Koch. The patient will complain of dryness and uneasiness about the throat, followed later by difficulty in swallowing—the dysphagia in advanced cases being the most distressing of all the symptoms, even the blandest nourishment being refused on account of the agony caused by attempts at swallowing.

Impairment of the voice is soon observed, varying from slight hoarseness to complete aphonia, its extent depending on the character and situation of the laryngeal lesion. The cough is strident or brassy in proportion, as the voice-producing structures are affected. This is particularly noticed in those who use their voices excessively, with faulty method of tone production, as public speakers, singers, hawkers, auctioneers, etc. With the cough at first there is expectoration of mucus, which later becomes mucopurulent. Hemorrhages may occur from erosion of the laryngeal capillaries. The constitutional symptoms are malaise, progressive weakness, loss of weight, slight pyrexia, usually apparent toward evening, with subnormal temperature in the early morning hours.

Laryngoscopic appearances: J. Solis Cohen (*loc. cit.*) called attention to the anemic appearance of the laryngeal structures. This is probably part of a general anemia. More significant, however, is a diffuse hyperemia, affecting the arytenoids, interarytenoid space, epiglottis, and, to a lesser extent, the vocal cords. In brief, the appearances are those of acute laryngitis of varying intensity. In another group of cases, small superficial ulcers are seen on the vocal cords and arytenoids. In more advanced cases, the typical tuberculous laryngeal infiltrations and ulcerations are observed, with which you are all familiar.

The differential diagnosis of primary laryngeal tuberculosis is of much interest. The disease may be taken for any of the varieties of chronic laryngitis.

The granular form of chronic laryngitis is usually seen in the interarytenoid mucous membrane, in which glands are abundant. Pachyderma laryngis is observed in the form of a diffuse grayish layer of epithelium, which covers the vocal cords. Corditis tuberosa of Turck is a hypertrophy caused by excessive use of the voice with faulty tone production, as previously stated. It occurs as a true trachoma, and most authorities, notably Bonfiglio (*loc. cit.*), have observed that it is with this form of chronic laryngitis tuberculous infiltration of the larynx will most frequently be con-

founded, especially in the early stages when the disease is confined to the larynx.

Primary laryngeal tuberculosis is occasionally confounded with the circumscribed granulation tumors, due to syphilis or lupus. If due to the latter, the subsequent development of the characteristic skin lesions will assist in clearing up an obscure case. Syphilitic laryngitis is distinguished from the tuberculous form by the history of a cutaneous eruption and of mucous patches in the mouth, nose or pharynx; by the comparatively slight pain, the rapidly destructive ulceration, which is deep, clean cut and symmetric; by the early involvement of the cords, and by the prompt improvement which results from antisyphilitic medication.

Primary laryngeal tuberculosis may have to be distinguished from laryngeal neoplasms, as carcinoma and papilloma. In carcinoma the severe pains, the presence of a rapidly growing unilateral tumor of nodular outline, situated at or below the vocal cords, the early occurrence of a cachexia, and the microscopic appearances of a portion of the growth removed for the purpose, will assist the diagnosis. Papilloma develops preferably on the vocal cords; it is either pedunculated or sessile, and grows rapidly. It is not prone to ulceration, and tends to recur after removal.

The bacteriologic and histologic examinations are of the highest importance in arriving at a diagnosis of primary laryngeal tuberculosis. The absence of tubercle bacilli from the sputum, or from the scrapings taken from the larynx, is not to be taken as conclusive evidence of the absence of the disease. Trudeau[23] states that the tuberculin test is of value in those cases in which the bacilli are not found and when fever is not present. A word may be said as to the histologic examination in suspected cases. Laryngeal tuberculosis, according to Bonfiglio (*loc. cit.*), may present itself either in the form of infiltration of the mucosa or submucosa, or as excrescences or vegetations. In the infiltration form, the tissue is granular in appearance, rich in cellular elements, more or less vascular, and contains a few giant cells and some small tubercles of typical form. The vegetative form preserves for a long time its epithelial investment. The connective tissues show the structure of granuloma with papilliform elevations more or less developed. True tubercles may also be found, as in the infiltrated variety, thus establishing the diagnosis. In the advanced stages of both forms, degenerations and caseous necrosis may be observed.

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DISCUSSION.

Dr. Thompson: Mr. Chairman, in this connection I would like to report a case of primary laryngeal tuberculosis, for its bearing upon the treatment of these comparatively rare lesions. Some four years ago I saw, in consultation, a stalwart, healthy-looking young German, twenty-three years old, with a nodule in the right anterior pillar of the fauces. His family physician had regarded this as syphilis, although there was no evidence of syphilitic disease, and had prescribed iodides for about a month. The iodide had no effect upon the nodule, and the case was then brought to me for consultation. At that time the diagnosis lay

between the beginning of a malignant disease and tuberculosis. He was a worker in a glue factory. The raw material from which glue is made is very largely an outcome of a slaughter-house, and, with the prevalence of tuberculosis among cattle, it might furnish a means for suspecting its origin. A second small nodule developed lower down, showing that the disease was extending in the lymphatics. There was no involvement of the cervical chain, and no constitutional symptom. I gave the opinion at the time that the lesion was tubercular, and suggested constitutional treatment. It happened the family left, and neither of us saw the man for nearly six weeks. When he returned, there was a third nodule still lower in the pillar, and evidently by this time, from the color and appearance, distinctly tuberculous. He was put on local treatment, and, with the recovery comparatively complete, except for slight thickening at the point of local trouble, he was dismissed from treatment. Six weeks or two months later he returned to the office, with a distinct nodule in the right ventricular band. I regarded that also, from its history and appearance, as tubercular, and advised local treatment again. The patient was very much dissatisfied with the slow course before, and decided that he wanted an operation There were still no constitutional symptoms apparent. Temperature and pulse were again carefully noted. I declined to operate, fearing just what did occur. He left me and went to another laryngologist, who made an attempt to remove the nodule. Some time after the operation he returned to my office, with a temperature of 102, with all the anterior cervical glands enlarged, and with beginning mucouse râles in the upper part of the right lung. The operation did what I feared. It generalized the trouble. It is known to the general surgeon that if you attempt an operation on a tubercular nodule, and do not succeed in removing it entirely, you run great risk of general infection. That is exactly what happened in this case. It is difficult even for the most skilful operator to attempt to remove a primary infiltration from the larynx, and do it completely. The result in this case was to generalize the disease. It extended rapidly through the lymphatics to the lungs, with, I think, finally a fatal result, although I sent the case to Colorado as soon as the ulceration had healed, but the reports I had for some months afterward were decidedly unfavorable. The point in this case is that if you recognize a primary laryngeal tuberculosis, it is not a case for operation and that class of treatment.

Dr. Blauw (invited guest): I would like to ask the doctor if he has had any experience in the line of treatment of Dr. Arloing, of Lyons, in France?

Dr. White: It is, I believe, a mooted question whether there is any primary tuberculosis of the glottis. I am still somewhat in doubt about it myself, although in my own experience I have seen some cases that would tend to confirm the position of those who claim that we do have, unquestionably, primary tuber-

culosis of the larynx. I can mention one case in the last few years, and a more typical case to illustrate that point of view it would be difficult to find. It was a Presbyterian clergyman, a professor in Union Theological Seminary, one of the most distinguished men in the Presbyterian Church. He had been teaching for a long time, and had made quite a distinguished reputation for himself as a teacher, preacher, etc., and his voice began to fail. He gradually became hoarse, losing more and more of the power of his voice, which was a very fine one. He began to lose flesh; he was a man weighing 195 to 200 pounds. He lost over 50 pounds in weight, and his voice gradually became almost entirely extinct. He had a rise of temperature in the evening. He had been under the observation of several persons, all of whom diagnosed the case as one of tuberculosis of the larynx. Then I examined him and I found edema, swelling in the larynx and ulceration, limited entirely, however, to one side. The edema, however, was in both, so much so that he suffered from dyspnea. I made a careful examination of the chest, and could find nothing there to indicate that there was any infection. I had his sputum carefully examined by two well known microscopists in our section, and both decided there were no tubercular bacilli. Clinical symptoms, however, pointed to tuberculosis, although the physical examination showed no signs in the lungs, and the only evidence we had of tuberculosis was, as I stated, the loss of flesh, the rise of temperature, the ulceration present, and so on. There was absolutely no trace of specific trouble. He had been put upon iodide of potash, and there was no improvement. When I began to treat the case I curetted the ulcerated area and applied pure lactic acid, and put him on the creosote treatment. Under this treatment, in the course of eight or ten months, he steadily improved, and now, three years after he first came under my observation, he weighs 195 pounds, larynx perfectly well, not a sign of trouble, never had shown any other evidence of tubercular infection. I regard his voice to-day as perfectly restored, and I regard him as a perfectly well man. This is now three years. I expected all this time to see some evidence of complication of the lungs. Up to this time there been none. I simply diagnosed primary tuberculosis of the larynx by exclusion. Excluding everything else, I came to the conclusion I was dealing with primary laryngeal tuberculosis. I diagnosed it as that when I first saw him. I know that this is not positive. I have another case under treatment at present, which I have watched about eight months. He left me two or three months ago, and came back two or three days ago. This is a case of edema, slight ulceration, decided swelling of the left ventricular band. The cord that I can see is perfectly white. There is no inflammation at all. The voice is not aphonic, but disphonic. He has slight pain. He has also rise in temperature. Bacteriological investigation shows no trace of tubercular bacilli in the sputum. He has a slight cough, has a rise of temperature in the

evening, and so on. Physical examination shows no evidence of tubercular infection of the lungs. This may be another case of primary tuberculosis of the larynx, but here again it is only by exclusion that I make the diagnosis. In this case, however, he improved considerable under treatment. When he came back he was in very much the same condition as when he came to me last fall, and I sent him home very much improved. He has not made the progress which was made in the other case. I simply wanted to report these cases as illustrative of what Dr. Donnellan has said.

A Member: How much of the creosote do you give?

Dr. White: I never used pure creosote at all. I used a preparation of creosote, Wyeth's preparation. I used the carbonate, the valerianate, the salicylate, according to the symptoms. Where there is fever I use the salicylate. There is one preparation I find very valuable, the guaiacol carbonate. I used three-grain pills, three time a day, and gradually run up to seven or eight pills a day. This case I spoke of that improved so much, I started on the pure creosote, but his stomach would not bear it. For that reason I have given up the creosote in its pure form.

Dr. Wendell C. Phillips: I have never been able to get rid of a lurking skepticism as to whether there is any such thing as primary tuberculosis of the larynx. I could conceive of but one way that we can have that condition, that is by direct infection. If you can reconcile direct infection with primary tuberculosis you may have some explanation, although I never have been able fully to lose my skepticism as to whether it ever does occur. You will notice that the writer of the paper in several instances mentions examination of the lungs revealing no lung trouble. What do you mean by an examination revealing no lung trouble? May there not be a lurking tubercular condition in those lungs all the time, and may not that condition precede the tubercular condition of the larynx? I believe in almost every instance, if not all, that that condition does exist.

People who suffer with tuberculosis differ in their powers of resistance. Some persons resist the disease to such an extent as to finally throw it off. The power of resistance of onslaught of tuberculosis is very great in many people. It has always seemed to me that, in these cases of laryngeal tuberculosis, there was at the same time the same condition going on in the lungs; and, if the person ever recovers from laryngeal tuberculosis, I believe it is because of his great powers of resistance to the disease itself. I was somewhat surprised to hear Dr. Thompson condemn the curetting treatment and the use of lactic acid, for I had become almost convinced that in an occasional case that form of treatment was successful. Dr. Gleitsman has reported a number of successes, and I had begun to think that perhaps there was some hope of permanent benefit in this form of treatment. These men who use it, like Gleitsman—I do not recall the Germans who have used it so much, but they are very thorough. It is remarkable

how much tissue they will remove with these cutting curettes before they begin to use the lactic acid, and the effort is to get beyond the invasion of the tubercular condition.

As to the symptoms it seems to me one of the most marked symptoms we ever find in any primary tuberculosis is the anemia, the anemia that will show itself in the larynx and the pharynx when you make the examination.

The differential diagnosis, it seems to me, should not be particularly difficult, especially if you have a case that is well marked. It seems strange to me that it should be difficult to find the tubercular germ in laryngeal tuberculosis. The diagnosis, so far the discovery of the germ is concerned, ought to be easy, because you can get at it. You can take some scrapings if you fail to get it in the sputum. In the case referred to by Dr. White, it seems to me those were not tubercular cases at all, but some other forms of ulceration. As a rule, speaking of ulceration of the larynx, we always put some other name before it. It is syphilitic ulceration or tubercular ulceration, or there is some other name which we put before it. I have thought at times that there might be such a thing is simple ulceration of the larynx not associated with syphilis, not associated with tuberculosis or with other diseases. It is a question in my mind if many of these cases, and especially those that recover, are not cases of that kind.

Dr. Donnellan: Mr. Chairman, I have endeavored in my remarks to give the best evidence I could supporting the proposition that there was such a condition as primary laryngeal tuberculosis. I have had a good deal of experience in laryngeal tuberculosis in recent years, in hospital service that I am connected with, in which there are a large number of consumptives and in which cases I have to make examination of the larynx from time to time. I have seen a number of cases of laryngeal tuberculosis, not only as a complication of the pulmonary involvement, but what seemed to me, as far as the evidence went, to be cases of primary laryngeal tuberculosis. I will not weary you with citing those cases, and will only make a brief reference to two of them. One was a private patient I saw last year, and whom Dr. Miles, of New York, was good enough to see in consultation with me and confirm the diagnosis, a gentleman who, while he had tubercular bacilli in his sputum, had involvement of the larynx and physical signs of pulmonary tuberculosis. I was much impressed with what Dr. Phillips said as to the possibility of a lurking tuberculosis where the larynx was involved, and where there are no physical signs in the chest. I believe, myself, that there is the strongest possibility of such a condition existing. I believe the pulmonary signs of tuberculosis are not apparent until there has been very extensive solidification. As has been said, the best place to study tuberculosis is in the larynx.

I think it is pretty well recognized that there are two modes of infection, one is by direct infection, inhalation of dust-laden atmosphere impregnated with tubercular bacilli, which find a

nidus, a resting place, for their development. There is no reason why they should not develop in the larynx and find a resting place there, as well as any other place in the lung tissue or the respiratory organs. The authorities seem to record that there is a latent tuberculosis, which only needs that impairment of health to light it up, either acute or chronic process. Those cases we generally see in diffuse tuberculosis, with early lung involvement. A series of investigations has been made by certain physicians as to the artificial production of primary laryngitis. In monkeys you have an irritation of the laryngeal mucous membrane and apply tubercular culture media, laden with the bacilli, and in a few instances have they been able to produce laryngeal tuberculosis, or none at all. But I do not think that proves very much. The monkey in which the experiments were made may have been immue, the same as we have immunity of certain animals to cholera and syphilis. Certain diseases are property of certain branches of the vertebrate group, and others are the property of other branches of the vertebrate group. While tuberculosis is not the exclusive property of the human race, at the same time I think there is a group of mammals it is exclusively confined to, so that I do not think these experiments are to be taken as conclusive of the fact that it is impossible to produce primary laryngeal tuberculosis by ordinary means.

In regard to the question of treatment, I did not intend to go into that at all. As I stated in my paper, my remarks were restricted to the subject discussed. There is a vast amount of evidence to show that cases of undoubted primary laryngeal tuberculosis exist, followed later on by secondary lung involvement. Another point is that you may have general tuberculosis of the upper respiratory tract without any physical signs in the lungs, and you have to base your diagnosis on the laryngeal appearances and on the finding of tubercular bacilli in the sputum and other important histological appearances, from the scrapings, etc. I see no reason, and there is no pathological reason why you should not have an involvement of the mucous membrane from direct infection.

PAPER:

TRACHEAL INJECTIONS.

BY JOHN A. THOMPSON, M.D.

Very early in my work as a laryngologist I was impressed by the inadequacy of local applications, as ordinarily made, in acute and chronic disease of the larynx. We could reach all the inflamed membrane in the nose and pharynx, but an application to the larynx left inflamed membrane distinctly visible in the trachea, to which no medication could be applied by ordinary methods. Observation also taught me that in cases of chronic laryngitis recurrent attacks of inflammation developed from below upward, causing a return of all the symptoms of chronic laryngitis. The use of sprays and nebulizers to treat locally the inflamed mucous membrane of the trachea and bronchi was never very effective. Remedies given internally have little or no effect on inflammation of the tracheal mucosa.

While considering this problem I read in the *British Medical Journal* Mr. Walker Downie's account of his experiments with different solutions injected directly into the trachea. From this article I learned what I had regarded as impossible, that medicines could be injected directly into the trachea without much discomfort and with no danger to the patient. Mr. Downie was not the originator of this method of treatment, but he was the first author whose work came under my observation. At this time (nine years ago) a woman with well-marked tuberculosis was brought to me to see if any local treatment would favorably affect her cough. The paroxysms of coughing were so severe that she vomited all her meals, and got very little sleep. She was failing rapidly from inanition, and her death was apparently only a matter of weeks. All internal medication had failed to control the symptoms. Here was a case where tracheal injections certainly would do no harm, and might do a great deal of good. She was at once put on a course of injections of menthol, camphor and guaiacol, given daily. The first injection relieved the cough for about eight hours. At the patient's suggestion I began treating her in the evening, and, following the injection, she could retain her dinner and get six to eight hours of comfortable sleep.

Her general condition improved rapidly, and all unfavorable symptoms disappeared. There was a reurn of the tubercular symptoms during a subsequent pregnancy. Tracheal injections again controlled the cough, and the pregnancy went on to full term. With occasional relapses, the patient lived for nine years after I first saw her before she finally succumbed to the disease, which was well advanced when I first examined her.

While this case was still under observation, I was asked by the same physician to see another patient where gummatous deposits in the lung had broken down and were producing a large amount of very offensive discharge. The history of syphilis extended back for several years. For four years before I was called in consultation the patient had been under the constant care of good physicians, but internal medication had failed to relieve her symptoms. She had lost fifty pounds in weight, had an evening temperature of 104°, and her condition indicated speedy dissolution. Knowing that all possible internal medication had been tried, I gave this case daily injections of menthol, camphor and guaiacol to control the sepsis. I hoped by putting liberal quantities of medicine into the trachea to reach and disinfect the abscess cavity, which was low down in the right lung. The cough and expectoration ceased in six weeks after begining treatment. In three months the patient was entirely restored to her former weight and strength. She is still alive, and in good health.

These cases encouraged me to continue the use of the tracheal injections in other and milder forms of disease, so for the last nine years I have used the method daily, and will present very briefly a summary of my observations in that time.

A word as to the technic may not be out of place. The larynx is illuminated in the ordinary way. The patient holds his own tongue while the physician guides the tip of a properly curved laryngeal syringe back over the glottis. Then while the patient takes a slow, full inspiration, the medicine is injected between the cords and into the trachea. It is not necessary nor advisable in the ordinary treatment to touch any part of the larynx with the tip of the syringe. If the patient will follow your directions as to the method of breathing the injection is very easily given. In only a few cases of people with very little self-control will it be found impossible to give effective injections. The amount of cough and strangulation produced is very slight. So little reflex action takes place that I have been told a number of times by physicians who have watched the injections given that I had certainly not

put medicine into the trachea. With a patient accustomed to the method, I have no difficulty in convincing these scoffers by showing them, with the aid of a laryngeal mirror, the stream of medicine dropping into the trachea. There is an apparatus now on the market for throwing solutions directly into the trachea by means of compressed air.

The advantages to be secured by direct medication are, first, you get the direct local action of the remedy. From our work in the nose and pharynx we know pretty accurately what effect certain remedies will have on inflammation of the mucous membrane of those cavities. It is reasonable to expect the same effect when you can drop the medicine directly into the trachea and bronchi on the mucous membrane of these structures. We cleanse, soothe and partially sterilize the mucous membrane of the nose and throat by direct applications. The same results can be obtained by the same remedies on the mucous membrane of the lower air-tract. In addition to this direct local action, we gain a very marked constitutional effect from remedies injected directly into the lungs. The pallid, cold extremities of the tuberculous patient will be flushed and warm within a few minutes after an injection of a menthol solution, and this stimulating action on the circulation is kept up for hours. Another advantage of treatment by direct injection is that our medcines reach the diseased area unchanged by chemical action in their passage through the digestive organs and the blood. In this method we know definitely what we are applying to the mucous membrane of the lungs. We do not know in what form our remedies reach the same structure when given internally. Another and very important advantage is that medicines given by direct injection do not unfavorably affect digestion and nutrition. They are so much more effective when applied directly to the inflamed organs that we can dispense with narcotics for the control of the cough even in bad cases of acute inflammation or in advanced cases of chronic tuberculosis. Every careful physician dreads the day in consumption when he must decide which will do the least harm, to give his case opiates or allow him to be racked by the cough and weakened by pain. With symptomatic direct medication to the lungs the cough can be controlled without opiates, and they are needed to relieve pain only in secondary pleurisy.

These advantages show that there are a number of diseased conditions to which direct medication is applicable. In the very early stages of acute bronchitis, where the membrane is dry and

highly inflamed, the injections are harmful and should not be given. The old-fashioned remedies, such as Dover's powder and a good sweat, are more helpful here than direct medication. A little later in the case, when free expectoration has begun, the direct treatment is much more valuable than any given in the ordinary way. The duration of an ordinary case of acute bronchitis can be shortened one-half by direct injections. In those cases bordering on the chronic variety, where the cough has existed for several weeks and resisted all internal medication, the cure is usually prompt and easy by the injection method. In chronic bronchitis there is no comparison between the results to be obtained by direct injections and internal medication. There is an immediate amelioration of symptoms as soon as the injection treatment is begun. The cough and amount of expectoration lessen as though by magic. In cases with dilated bronchi, the walls of which are suppurating, giving rise to an offensive purulent discharge, little or no benefit is gained by internal medication. A few injections in these cases relieve the patient of the offensive odor and rapidly diminish the amount of pus secreted. Should there be no organic lesion in other portions of the body a cure of chronic bronchitis is only a question of the patient's willingness to continue the treatment. I have never found a case that was willing to return to internal medicine after a few effective tracheal injections had been given. Chronic bronchitis is a feature of other diseases where the symptoms can be greatly relieved by the cure of the bronchitis by tracheal injections. Almost every case of chronic asthma also has chronic bronchitis. A cure of the bronchitis results in a marked lessening of the frequency and severity of the attacks of asthma, if it does not entirely prevent their recurrence. Cases of asthma with pulmonary emphysema can also be benefited by the cure of the chronic bronchitis by means of tracheal injections. I have kept apparently hopeless cases alive and comfortable for years by the use of the injection treatment whenever an asthmatic paroxysm or an attack of acute bronchitis threatened to cut short the career of the sufferer.

The observing laryngologist will see many cases of chronic inflammation of the mucous membrane of the trachea when physical examination gives no sign of similar troubles in the bronchi. I have never been able to see anything in the course of these cases that convinced me that remedies given internally had any effect on the inflammation of the tracheal mucosa. The cough, muco-

purulent discharge, and burning sensation behind the sternum can all be very promptly cured by direct medication. In pulmonary tuberculosis tracheal injections are not directly curable. That is, they have no direct toxic action on the tubercle bacillus and probably have little effect on the infiltrated areas. They do have a very marked curative action on the bronchitis that accompanies this condition, and by relieving this complication they very greatly lessen the cough and expectoration. Where the infiltrated areas have begun to break down in the lung and the usual secondary infection by germs of suppuration has taken place, tracheal injections will disinfect these cavities and greatly lessen the amount of suppuration and absorption of decomposed products. By so doing, the fever, which is a septic fever, is greatly lessened. The danger of secondary laryngeal tuberculosis is greatly lessened if we diminish the cough and the amount of infective expectorated matter that must pass through the larynx. Pulmonary syphilis is, fortunately, a rare condition. The second case cited earlier in this paper shows what can be done when such cases are encountered.

The most effective medicines for use by this method are those which are volatilized slowly by the temperature of the body so that their vapors reach all portions of the lungs. In this class first rank should be given to menthol, camphor, creosote and guaiacol carbonates, and chlorophenol. They should be dissolved either in one of the light petroleum oils or in olive oil. Two per cent. solutions of the menthol or camphor, singly or combined, can be used without pain or irritation. The carbonates of creosote and guaiacol are painful if more than 1 per cent. solutions are used. Chlorophenol I have used only in very small doses of a 1 per cent. solution. Of the other remedies given, from two to four drachms of the solution can be employed for each injection.

The longer I employ this method of treatment the higher becomes my estimate of its value. By ignoring or neglecting the use of direct medication for inflammatory or infective conditions in the throat and lungs physicians are depriving themselves of the most efficient means of treatment.

DISCUSSION.

Dr. HALSTED: Mr. Chairman, I wish to say that four years ago I had the pleasure of hearing Dr. Thompson read a paper on this subject. I was so much impressed by it that before leaving Washington I purchased a syringe and began at once to make

use the method as he described it. From that day until now I have used it daily in all the conditions which the doctor has just mentioned and with most gratifying results. I wish to say I think the doctor has not overdrawn the matter in the slightest. During the recent epidemic of influenza where we had so much acute trachitis and bronchitis, I used it four, five, six and seven times a day in my office, and almost invariably with gratifying results, both in the sense of giving immediate relief to the patient as far as the cough and discomfort went, and in cutting short the disease. I wish to thank the doctor most heartily for the benefit which I have received from his last paper and from this one.

Dr. Donnellan: I wish to thank the doctor, also, and to endorse from my limited experience the valuable therapeutical agent of tracheal injections I may say my experience has been somewhat restricted, and began as the result of personal conversation a year ago in Philadelphia with Dr. Halsted who was kind enough to relate to me the previous paper read by Dr. Thompson in Washington. I immediately provided myself with a laryngeal syringe, and used it in a large number of cases in dispensary and private practise, invariably with excellent results. I will say, however, that I have found a preliminary application, not of cocaine, but in my earlier attempts of the suprarenal extract to the larynx, has made the passage of the syringe and the injection a very much easier performance than it was under local anesthetic or even with the cocaine to which some people object by reason of its unpleasant effects locally and constitutionally. I have found tracheal injections have a wide range of application in the acute and chronic conditions of bronchial trouble. I have also found them of distinct value in cases of tuberculosis of the upper air passages, not only the laryngeal varieties, but in cases of pulmonary complication. I believe myself, that their value is by reason of the fact that you bring the tracheal and bronchial mucous membrane into a healthy aseptic condition in which it is impossible or difficult for the tubercular bacillus to find a developing medium, if together with the tracheal injections and the attempts to bring the bronchial membrane into a healthy condition is combined the suitable outdoor life to which attention has been directed in recent years, and a careful attention to the nutrition of the patient, keeping it up to the highest pitch of efficiency and leaving the stomach alone from medication. I believe you have reason to be encouraged in the ultimate results of a case that is not too far gone when you have it placed under your treatment. I must say a word as to the submucous injections of the larynx or rather above the larynx for instance where you have tubercular infiltration of the arytenoids and epiglottis. I have no doubt that submucous injections by means of the special syringe brought to the attention of the profession in an article published in the *Lancet*, and minimum doses of guiacol, will be found advantageous. The symptoms have promptly disappeared and the results have been encouraging in many cases. The emulsion

suggested by Dr. Frudenthal of New York, I have had some experience with this winter and have been gratified with its results.

Briefly I wish once more to thank the doctor for the pleasure I have derived and the profit I have gained from his very interesting and valuable paper.

PAPER:

CLINICAL NOTES.

BY GEO. T. ROSS, M.D., D.C.L.

Congenital Stenosis of the Larynx.

A. B., aged three years, child of Hebrew parents, living in the Maritime Provinces, in good circumstances, was brought to me for difficulty of phonation. The child had never cried since she was born. When irritated or forbidden to have her own way, instead of showing her resentment by loud crying, she would give vent to a muffled sound as if a gag were held over her mouth. No other sound was ever uttered by the child. Deglutition was perfect and the nourishment of the body was natural, so that when I saw her she was a healthy, even robust, child. The growth and health of the patient from infancy being normal, the parents did not seek other advice than that of the local practitioner until she reached the age of three years. I made special enquiries regarding syphilitic heredity or other dyscrasia occurring in the family connection near or remote, but failed to elicit any testimony sufficient to establish the origin of the malformation. No family history of similar growths could be obtained.

The whole difficulty being referable to the larynx, I proceeded to examine that organ, a rather troublesome matter with a fractious child, the parents of which had by over-indulgence rendered her disobedient and ill-tempered. Being very anxious to ascertain if possible the nature of the stenosis, after much effort I succeeded in obtaining a glimpse of the following condition:

Mucous membrane of the larynx apparently healthy throughout. A web or band was seen stretching across the glottis, which bound the vocal cords together. The color of this band was lighter than the surrounding mucous membrane generally. Inspiration and expiration was conducted through an oval opening in the web, large enough to admit of the aëration of the blood when the child

was not excited, but any excitement at once produced a cyanotic state.

The term stenosis is rather ambiguous, since nearly every deviation from the normal in this region is apt to obstruct the calibre of the laryngeal tube to a greater or lesser degree, but congenital stenosis is not an ordinary state, and thus I have thought it worth while to bring it before your attention for the purpose of discussion as to the line of treatment which is likely to give best results.

Arrested development of the larynx is sometimes found along with imperfection of the genital tract; and the respiratory apparatus being formed from the same source as the larynx, it is rare to find that organ mal-developed without some want of complete formation in the lungs, trachea of bronchi. In this case no trace could be found of any divergence from the normal; indeed, the entire bodily development was otherwise perfect.

The case having been explained to the parents and the necessity for operative treatment set forth, very strong objection was made to any measures of an operative character, and the child was taken home until the parents could decide the matter.

Papilloma of the Epiglottis.

J. D., aged thirty-nine, plumber, seen in November, 1900, complained of cough and pain upon swallowing, but the latter symptom was not severe and more like the sensation as of the presence of a foreign body. Empty swallowing caused more discomfort than in taking food.

Patient is a medium-sized man of good development and well nourished. Has lost weight recently and his work fatigues him more than usual. Cough was thought by patient to be due entirely to the throat trouble, but examination showed loss of resonance in the apex of left lung. Family history is decidedly tubercular, two brothers having died of phthisis pulmonalis.

On examination of larynx, it appeared generally anæmic. Epiglottis is red, tumefied, and somewhat puckered over two-thirds of its area, beginning at the right aryepiglottic fold. To this extent it was double the ordinary thickness and its mobility was greatly diminished. The tumor was mostly smooth, but some elevated patches were noticeable here and there, while it was covered throughout with hyperæmic mucous membrane. No warty excrescences were present. The inter-arytænoid space was

somewhat puckered and infiltrated. The ventricular bands, trachea and œsophagus were generally anæmic, but no ulceration was anywhere visible. Tubercule bacilli were found in the sputum. Prof. Bruere, of Bishop's College, kindly examined a piece of the tumour which I sent him, and reported that it was a true papilloma.

Under treatment, cough subsided and bacilli disappeared, with a distinct gain in weight of ten pounds in two months. The tumor meantime has steadily grown without causing much increased discomfort; it has a greater thickening at the aryepiglottic fold on the right side, while two more distinct lobules are in evidence apparently by a contraction in the centre of the tumor. The general surface of the larynx is unchanged in color, while more immobility of the epiglottis is plainly seen. There is no ulceration or increase of dysphagia, and no increased obstruction to respiration.

The improved strength and constitutional gain during the past couple of months were such that patient desired operation to relieve the sensation of a foreign body in his throat. He has been persuaded to go to the country for the summer with nothing but a cleansing spray and constitutional remedies.

My object in bringing this case before the Society is somewhat the same as last, viz., to discuss the advisability of removing such a tumor in the face of a marked tuberculous condition. Suppose the patient to return home distinctly improved in health, and no bacilli to be found, while the tumor continues to grow, or even remains quiescent, with no increased discomfort in swallowing or breathing; would an operation which would take away half the epiglottis be warranted? I am aware that many would decide against operating, but some others may be present who have done such an operation successfully under similar circumstances. I may say that the wound made by excision of the specimen for examination healed perfectly, and that no bacilli were found in the tumor; while the possibility of such a tumor becoming malignant must be considered.

PAPER:

A CASE OF ACCESSORY THYROID TUMOR AT THE BASE OF THE TONGUE.

BY CLEMENT F. THEISEN, M.D.

Accessory thyroid tumors at the base of the tongue are sufficiently rare to make the report of even a single case of some interest.

In January of this year, Mrs. C. G., sixty-seven years of age, was brought to my office by her physician, Dr. Sherman Van Ness, of Chatham Centre. She had been having trouble with her throat for a long time. As she expressed it, she felt "as though she had a lump in the throat." Her physician had the tumor under observation for nearly a year, and stated that at times there seemed to be an acute hyperæmia of the growth, and it then seemed to be larger than when the mucous membrane was in a normal condition.

She had an attack of influenza about two weeks before consulting the writer, and was not in good general health, being pale and thin. On inspection of the throat a tumor considerably larger than a hen's egg was seen, which, when examined with the finger, was found to be situated at the base of the tongue and appeared to extend fairly deeply into its substance. (See illustration. The diameter of the portion shown here is about two-thirds the actual size). The diameter of the tumor at its widest portion, was as nearly as could be determined, about 1¾ inches. It was covered with a perfectly smooth mucous membrane, was not very hard, but rather more resilient to the sense of touch, and of a deep red color. Extending over its surface were several blood vessels, and the growth presented the appearance of considerable vascularity. It was not at all nodular, there was absolutely no involvment of the glands of the neck, the patient was not cachectic, so that its benign character could be at once determined. It was not attached to the epiglottis, for the finger could be readily passed between it and the tumor. Patient suffered no pain and respiration was not much interfered with. As the case was identical in every respect with those described by Schadle and Warren, a diagnosis of a probable accessory thyroid tumor was made.

Considering the patient's age, general condition at this time, and the probability of severe hemorrhage, I did not feel justified in subjecting her to an operation with the hot loop or to the method of operating employed by Warren in his case, as the danger of hemorrhage by either method was considered too great, and if it occurred, could not be readily controlled.

Drs. George Blummer and A. MacFarlane, of Albany, saw the case in consultation with me, and agreed both as to the nature of the tumor and the inadvisability of an operation.

Patient was given thyroid tablets simply as an experiment, a 5 gr. tablet with $^1/_{60}$ gr. of strychnia, being administered after each meal, and continued for six weeks. This was followed by no bad effects, no nervous symptoms developing. The tumor was again carefully measured and appeared to be somewhat smaller, although it is quite possible that the first measurements were not entirely accurate. The administration of iodide of potash was also advised. A very interesting case of accessory thyroid tumor in this region has been reported by Schadle (Trans. Section on Laryngology and Otology, A.M.A. 1899).

His case occurred in a young married woman, twenty-five years of age. The growth was about the size of an English walnut, and was of a deep purplish-red color. The tumor was removed by Dr. McBurney, and on microscopical examination was found to be a gland of the thyroid type. A second case in which the tumor was slightly larger than a hen's egg, and situated at the base of the tongue was also seen by Schadle. The diagnosis in this case was not verified by histological examination, but it too, was undoubtedly a case of accessory thyroid.

Another case in which the diagnosis could be positively made has been reported by J. Collins Warren (American Journal of the Medical Sciences, Vol. CIV. P. 377. 1892).

His patient, a married woman, fifty-two years of age, had noticed a lump in the throat for twenty-two years. On examination a tumor about the size of a hen's egg was seen situated at the base of the tongue. Under ether the tongue was brought forward by ligatures passed through the tip and dorsum, and after an incision had been made along the median line, the tumor could be enucleated from its position. Patient was seen about three months after the operation and there was at that time no indication of a recurrence.

The microscopical structure of the growth was found to

be that of a ductless gland, with colloid degeneration, and in all essential histological details corresponded to the thyroid.

H. C. Butlin, (Transactions of the Clinical Society. Vol. XXIII. P. 118. 1890), has collected eight cases including two of his own. They all occurred in females. Operations were performed in both of Butlin's cases. In the first, a woman thirty-two years of age, the tumor was removed through the mouth by an incision in the median line, a preliminary tracheotomy being performed. There was a recurrence, but of much smaller size. The second case also occurred in a female aged twenty-three. The growth had existed two years and was removed with the galvano-cautery loop.

In this connection it may be of interest to allude also to the accessory thyroid glands occurring in the larynx and trachea. In this region they are far more common. V. Ziemssen, (Die Krankheiten der oberen Luftwege, Moritz Schmidt, P. 617. 1897), reported the first case of accessory thyroid occurring in the larynx. Cases have also been reported by Paltauf, Heise, Bruns, Roth, and Schrötter. In this locality accessory thyroid glands occur mainly in the form of bright red, sub-glottic tumors, about the size of a bean. As a rule the diagnosis can only be positively cleared up with the microscope. Scheuer has collected five cases occurring in the trachea. They were all situated on the posterior wall. Mention might also be made of a case reported by Bell (*Montreal Medical Journal*. Vol. XVII. P. 842. 1888-9). A tumor the size of a hen's egg, was situated directly upon the crico-thyroid space and first two rings of the trachea. Microscopically it was found to consist of thyroid gland tissue degenerated in the centre. Intra-thoracic goitres are of fairly rare occurrence, still Wuhrmann hasfound in the literature 91 cases altogether. They are supposed in part to take their origin from other accessory glands, particularly from the inferior accessory thyroid glands of Gruber.

In considering the origin of accessory thyroid tumors a tthe base of the tongue, I cannot do better than to give the views of His and Sutton.

Sutton (quoted by Schadle), states that they originate in connection with the lingual duct, a structure of embryonic significance. In the embryo a diverticulum takes place from the anterior wall of the pharynx, forming what is known as the thyreoglossal duct, and about this the thyroid gland is developed.

This duct opens at the base of the tongue at a spot represented

in the adult by the foramen cecum, and passing downwards, bifurcates to form the isthmus of the thyroid. As development goes on, the hyoid bone is formed, and in its growth divides the duct into an upper (lingual) and a lower (thyroid) portion. Both of these are, as a rule, obliterated when development is complete. Occasionally, however, either of the two portions persists, closed at both ends, and gives rise to a cyst. It is in connection with this lingual portion of the thyreoglossal duct, that such a tumor is developed.

According to His, the middle lobe of the thyroid is developed in a track which is directly continuous with the foramen cecum of the base of the tongue. Tumors occurring about the foramen cecum were formerly considered by some writers to be simply adenomata.

It is interesting to note that all the cases of accessory thyroid tumors at the base of the tongue mentioned above occurred in women. In conclusion the very large size of the tumor in the writer's case is worthy of note. Another interesting point is the fact that when the patient was a young woman she had a well-marked goitre. At the present time the thyroid can not be felt at all.

The fact, too, that at times the tumor is larger than at other times, is of importance from a diagnostic standpoint, as that is quite characteristic of such glandular structures.

I would like to say in addition that I regret very much an operation was impossible in this case, but at no time since January has the patient been in good enough condition. She is in very poor health. I would also call attention to a case Dr. McBurney operated upon for Dr. Schadle. Operations for tumors in this region are performed by simply putting the tongue forward and nucleating very quickly because you can not control the hemorrhage if it occurs. Dr. McBurney in this case performed a radical operation, and found only about one-half the tumor was visible. The other half was in the substance of the tongue. He performed a radical operation in cutting out the growth.

DISCUSSION.

Dr. BLAAUW, of Buffalo; invited guest: Mr. Chairman, I have been much impressed with Dr. Theisen's paper. The most interesting part of the subject to me is that when you should operate you very often get an œdematous condition, and the question is whether you should resort to the radical operation or not. I would like to ask Dr. Theisen about the patient's skin?

Dr. THEISEN: There was nothing characteristic about the patient's skin. She was very pale. What was the other question?

Dr. BLAAUW: My question was about a radical operation.

Dr. THEISEN: I do not think it was justified in this case.

Dr. BLAAUW: How did she get the tumor?

Dr. THEISEN: She had it for many years. Undoubtedly it was a slow growth. The question might justly be raised as to the correctness of my diagnosis. Of course I have no absolute way of verifying it, but simply made the diagnosis by exclusion. As for goitre, that is simply an abnormal thyroid.

A MEMBER: I would like to ask the doctor if he considered the possibility of hypertrophy of the lingual tonsils?

Dr. THEISEN: Yes, I thought of that but I excluded it. I do not know that you can exclude that positively.

Dr. DONNELLAN: I presented a case of that kind to the college of physicians and surgeons about two years ago, and the symptoms were the presence of an object in the mouth, something that wanted to be swallowed there. The patient felt as if she had a chestnut in her mouth that she could not swallow. There was very slight interference with the respiration, but it impinged on the epiglottis and you had a reflex cough and an inflammation of the larynx. It was regarded as hypertrophy of the lingual tonsil. I first of all tried to snare it, but it was too adherent. Within the last few weeks I have provided myself with the instrument of

Dr. Miles and in two sittings I have completely removed this growth at least down to the base of the tongue without any hemorrhage and with apparently good results. It is too early yet to say what the ultimate result will be, but the primary result was very satisfactory.

Dr. THEISEN: I have not anything special to say in conclusion except that I must say candidly I was very much afraid to operate in this case on account of the age of the patient and the patient's very bad condition. In this case Dr. McBurney operated upon for Dr. Schadle in which he did the radical operation, the hemorrhage was terrible. In several other cases the hemorrhage has been frightful, and in the condition of this patient it would be fatal. To call attention to the size of the growth, when the tongue was pulled forward, it filled the mouth completely. I have no doubt it was part of the substance of the tongue.

PAPER:

FIBROMA OF THE NOSE, WITH REPORT OF A CASE.

BY WILLIAM LINCOLN, M.D.

Pure fibromata arising in the nasal chambers and unaccompanied by similar growths in the nasopharynx are comparatively rare, but their occurrence is noted in most treatises on nasal diseases, and cases are cited. The following is the only case of this kind that has come under my notice:

E. J., aged eighteen years, came to the Western Reserve Dispensary, January 20, 1896, with a history of frequent and copious epistaxis and complete stoppage of the left nostril, with a constant purulent discharge from that locality. These symptoms had lasted about thirteen months, with increasing severity, and during that time his general health and strength had become gradually so lowered that at the date of coming to the clinic he was entirely incapaciated for any work. He is the eldest of eight healthy children, and had had no illness previous to this. Parents are both alive and well. No history of any former trouble with the nose or throat.

Patient appeared emaciated and weak, and had slight fever, which he stated was nearly always present. The left side of the face appeared bulging, nose broadened at bridge, causing frog-face. Slight ptosis and exophthalmia, and edema of lids of left eye, and conjunctivitis on that side. He also complained of sharp, shooting pains over entire left side of head and face. There were

present a suppurative otitis media of left ear. On dilating left nostril a grayish tumor, considerably pitted on the presenting surface, appeared protruding into the vestibule and entirely blocking the nostril. The mass was embedded in a thick, glairy, mucopurulent secretion, which showed distinct rise and fall of arterial pulsation. The right nostril contained no growth, but showed the septum bulging considerably to the right side throughout its entire length. A probe on this side passed freely into the nasopharynx. The mass in the left nostril, after cleaning and applying cocaine, was found to be slightly movable by the probe, to which it transmitted a very tough and resilient feeling. The probe, however, could not be passed in any direction around the tumor except in front of it toward the frontal region. Manipulation with the probe caused very free bleeding and some pain, and was followed by a copious discharge of pus. Post-rhinoscopic examination revealed a mass similar in appearance to that seen in front protruding from the inferior and middle meatus. To the finger this mass was hard and very slightly movable. The soft palate was somewhat depressed on the left side, causing thickened speech and difficulty in deglutition. No lymphatic swelling was discovered.

An attempt was made to pass the loop of a cold snare around the tumor, but the wire could not be made to pass alongside of the tumor because of the tough adhesions binding it to the walls of the nostril. By applying the snare twice, however, pieces large enough for microscopic examination were removed, and, although considerable time was taken to remove these pieces, very free bleeding followed. The nostril was then packed with sterile gauze and the patient instructed to report again.

Sections were prepared by staining with hæmatoxylin and eosin, and showed the tumor to be pure fibroma without sarcomatous change.

At the next visit of our patient he was found in a much worse condition. He reported having had frequent large hemorrhages and an increase in the purulent secretion, with intense pains radiating over entire left side of head. Had had chills and fever, and showed signs of pus absorption. He was advised to go into the hospital and to have the tumor removed as soon and as thoroughly as possible.

Operation performed February 22d. An incision was made, beginning a little inside the inner canthus of left eye and carried across the bridge of nose to same point of sound side, and another

begun at this point extended to right ala nasi. These incisions extended to bone. Periosteum was pushed aside and, with Hey's saw, the bones were cut through in the line of skin incision. An incision freeing the nose from the upper lip, but avoiding the gingivolabial fold of mucous membrane, was then made, and the septum divided in a line parallel to its anterior border and connecting with the incision at the bridge of the nose. The nasal bone on left side was then seized with strong forceps and the nose turned over on the left cheek. The slight hemorrhage occasioned by this operation was easily controlled by hæmostatic forceps. By the aid of a powerful electric headlight an excellent view of the tumor was then obtained.

During the preparatory operation described above the posterior nares had been plugged with gauze to prevent the blood from running into the throat. The nostril was now cleansed and the gauze packing in the nasopharynx removed. The tumor was examined clear to its attachment in the superior meatus. By means of a thin-bladed spatula the adhesions fixing the tumor to the nasal walls were broken through, and the loop of cold wire snare was passed along the floor of the nose and, by a finger in the nasopharynx, made to surround the tumor protruding through the choana and pushed up as far toward its pedicle as possible. The nasopharynx was then packed with a sponge, and, the anterior end of the loop having been pushed up to the base of the pedicle, the wire was drawn in by slowly turning the snare screw. The pedicle proved to be extremely tough, and the screw of the snare could only be turned by grasping it with forceps. Before the pedicle was divided the wire pulled through the eye of the snare, and a larger wire was quickly attached to one end of the useless loop and dragged into the same position as the first loop and threaded with the snare. The removal was then finished without further difficulty. The patient's pulse and condition at this stage necessitated frequent stimulation, and for this purpose four hypodermic injections of strychnine (gr. $^{1}/_{100}$) were given at short intervals. Profuse hemorrhage followed the removal of the tumor. After packing tightly for a short time the base of the pedicle was curetted thoroughly and afterward burned with Paquelin cautery. The nostril was then packed with iodoform gauze and the nose stitched back in place with silk sutures. Time of operation, fifty minutes. Free use of strychnine hypodermically, and whiskey by enema was ordered. The method of resecting the nose was, in this instance, the reverse of that usually em-

ployed, making the principal incision in the sound side. This was done on account of the large amount of purulent secretion which had accompanied the case and which it was suspected came from empyema of some or all of the accessory nasal sinuses. The discharge would therefore continue after the removal of the tumor, and it was feared would greatly hinder the proper healing of the line of incision. The measurement of the tumor immediately after removal was 6½x2½x1½ cm. The pedicle was 4 cm. long and of the same width as the tumor itself. An examination of the eye-ground on left side showed nothing but slight haziness of the fundus.

The patient needed considerable stimulation for two or three days. The first packing was removed after twenty-four hours and a lighter packing substituted. Very profuse purulent discharge was present for the first few days, but little bleeding. Second packing was removed in twenty-four hours and nose was left open. Nostrils were washed frequently with warm boric solution. Primary healing took place in entire line of incision except near canthus of left eye. At this point a little pus was forced through and a small fistula established, which, however, healed in two or three weeks. Patient was discharged from the hospital ten days after operation, and continued to come to dispensary. Recovery and healing were uninterrupted.

Examinations of the site of the tumor have been made since then at intervals of three or four months, but no recurrence has been observed—a period of five and a half years.

The interest in this case lies in the comparative rarity of the tumor in the nose unaccompanied by similar growth in the nasopharynx, and also in the satisfactory result secured by full exposure of the mass and its thorough removal.

DISCUSSION.

Dr. White: Mr. Chairman, I have operated upon two of these cases in the last three or four years but I operated in a different manner from this. In one of them the tumor was very large. I located the base; I thought it came from just above the middle turbinate, but it filled up the whole nose, projecting back into the post nasal space. The question arose in my mind how best to operate without performing the operation through the face, as Dr. Lincoln has done, operating from the outside. I could not pass a snare through the nose to remove it, so I pursued this method. I took a very fine catheter and threaded it with a wire, and I succeeded in getting that over the tumor into the post nasal

space and drawing it down to the mouth. I then slipped the catheter off the wire, leaving it threaded through the nose and out of the mouth. I then took the same catheter, threaded another wire in it and caught the end of the first wire and drew it back underneath the tumor. I manipulated then the best way I could with my fingers, put on the screw, and knowing from previous experience the dangerous hemorrhage I would meet I made turns of the screw at intervals and took four hours to get down to where I supposed I had got nearly through the tumor, and I got to the point where I could not cut it through.

I was afraid my wire would break, so as I had been through this once before and had a great deal of difficulty reapplying the wire I pulled off the wire, cut it off, took the platinum wire, threaded it on my original wire, pulled that around the pedicle and threaded that again through the galvano cautery snare and turned on the current. After I had the snare on it for four hours in this way I got the whole mass out through the post nasal space. It was a different shape from this. It was thicker and not quite so long as this, if this was the original size as shown in these photographs. In that case I kept the patient under observation for six weeks afterwards in the office, and I cauterized the pedicle with the galvano cautery from time to time and I had no recurrence. I had another case I operated on in the same way. I attempted to remove it; cut through the bone, the orbit, and by the by I was satisfied that it projected backward, that it invaded the antrum. And by the by I desire to say that I have operated on a number of fibromas of the orbit and never cured but one of them, and I have operated on a dozen or so cases. I have a number of cases with photo lithographs. Dr. Grey, in Washington, made a number of them for me, and all my cases of fibroma of the orbit have died, with one exception. I have operated with cases of simple fibroma. Their tendency to recurrence is their dangerous feature. I do not know whether the experience of others has been similar to my own or not.

Dr. Thompson: Mr. Chairman, we do not any of us see enough of these cases to get familiar with the technique. The method employed by Dr. White to get his snare around the fibroma of the nose I had used in another case where I was not able to pass a wire in the ordinary way. In that case I also had to do what Dr. White did. After I got the base so compressed that I could not tighten the wire any longer, I finally broke the wire snare on it, then cut the wire and took it out and passed platinum wire around and then burned off the base. In that case of fibroma, although the microscopist had assured me it was not malignant, it returned in three months and required the removal of the sarcoma, which by that time it was. As to the technique of the external operation, I think we do better by making an incision, starting in the internal canthus, making an incision down along the junction of the nose and cheek, fracturing that nasal bone and turning it to the other side and if you have not room

enough then make a section of the internal maxilla. That gives you room when you are required to have an external operation. In my experience the case has healed by first intention and the scar can scarcely be seen a few feet away from the patient. The point I wish to emphasize by way of a question is: Do not all these growths originate in the ethmoid itself? I never have seen a case of sarcoma of the nose that did not originate in the ethmoid. With the fibroma or with the sarcoma I believe we have not got a sufficiently radical operation until the corresponding lateral mass of the ethmoid is removed down to the orbital plate. In my only case of sarcoma of the nose that lived and is still living, now three years and a half after the operation, that was done. The operation was made in the way I described, turning the nose over to the other side, making a temporary resection of a portion of the maxilla, and knowing I was going to have a terrific hemorrhage I did not lose any time with the snare, but with chisel and gouge, cleaned out the ethmoid till I was down to the orbital plate. The hemorrhage was terrific, but as soon as we thought we had all the desired tissue, we put the portion of the nose back into place, sewed up the incision and began the constitutional treatment of the case. The patient, who was an old lady, recovered rapidly and is living yet, three years and a half after the removal of the tumor.

Dr. Ingersoll: Mr. Chairman, I saw this case of Dr. Lincoln's both before and after the operation and was interested, of course, on account of its rarity. I saw it before the operation, after the diagnosis had been made, then I have seen it twice, I think, since the operation just after the patient left the hospital, and some time later when there appeared to be no recurrence. The result obtained was exceedingly satisfactory, I think. The boy appeared to be perfectly well and no appearance indicating a recurrence. I had one case of my own in which the diagnosis was in doubt and the whole case was unsatisfactory. It was a poor Italian boy; when he was first brought to my clinic I made a diagnosis of malignant tumor, simply from the appearance of the tumor. The parents would not submit to any sort of an operation at that time, not even allowing a piece to be removed for microscopical examination. I gave them a bad prognosis unless a radical operation was performed immediatey. About two months later the child returned very much emaciated. The tumor not only involved the left side of the nose but the antrum and probably the orbit, because there was considerable exophthalmia. At that time they agreed to have a piece removed for microscopical examination. I secured only a small piece. The hemorrhage was quite severe and they would not allow me to remove any more at that time. The piece I secured was examined microscopically. The size of it was unsatisfactory. It appeared to be a fibroma. I am inclined to think, however, that probably if more had been secured, the tumor would have proved to be a sarcoma rather than a fibroma.

Dr. Donnellan: Mr. Chairman, I have been very much interested in the paper of Dr. Lincoln. I wish to say that immediately after my graduation the very first operation I assisted at, as assistant to a general surgeon, was a case of removal of fibroma of the nose, an exceedingly large one, and it made a profound impression upon my plastic youthful mind, and I have never forgotten it. It was about the size of a Bartlett pear, and the man had a typical frog-face. I knew all the details of the case before the operation, and urged him to have the operation performed. As I say, he had a typical frog-face, and was called frog by the urchins of the street. The operation was performed by a general surgeon, and he at once opened the nose by an incision down the outside and separated the nasal bones and got right in and removed the structure. I think it was considered whether it was wise to make a preliminary ligature. Anyhow, he removed the entire growth by scissors and cautery, and afterwards put the parts in apposition, and it was in the early days of the antiseptic surgery, and the result was most gratifying. I had an opportunity two years ago of seeing this man, sixteen years after the operation was performed, and there had not been the slightest recurrence of the growth.

In concurrence with Dr. Thompson's remarks, I read a very instructive paper, in the February number, I think of the Annals of Laryngology and Rhinology. I think the paper was written by Dr. Richard Lake or Dr. Lambert Lake, I cannot recall which, on the origin of those fibrinous tumors of the nose, and he brought excellent evidence to show that most of their origin was in the ethmoidal cells. I think he produced some evidence to show that ultimately if they were not removed there was a sarcomatous degeneration.

Dr. Lincoln: Mr. Chairman, I am gratified to hear these cases from the several gentlemen who have spoken on this paper. They were fully as interesting some of them, perhaps more interesting than my own. My observations were confined to this particular case. I think in regard to the removal of this fibroma without first a preliminary operation of partial removal of the nose, that was considered, of course, and in fact attempts were made. The tumor was very vascular and was complicated by two conditions, the first was the pedicle was so inaccessible and so high up, and second it was bound to the nostril by such tense adhesions that the attempt to remove it without first doing the operation described was given up.

In regard to operating, as Dr. Thompson has called attention to on the affected side, that I know is the preferable way and would be the preferable way in a majority of cases. Here, however, I think the operation was made very properly on the other side, because of the great amount of purulent secretion. As I have stated in my paper, in one small portion of the wound the pus was forced through. It was necessary, of course, to have the nose packed. The pus was under more or less pressure, and was

forced through the extreme upper edge of the wound. Where there was less pus, I think an operation as described by Dr. Thompson would be preferable.

As to the origin of these tumors, I believe Dr. Thompson states the best opinion is that they arise from the ethmoidal cells, are of an ethmoidal origin. I believe that is all I have to say in conclusion.

REPORTS OF CASES.

Dr. White: Mr. Chairman, I want to report a case for information. I do not know what it is. I want to ask somebody else. A case was sent by a young man, Dr. Johnson, of West Virginia, to Richmond, to have the diagnosis settled, and I do not know whether he got the matter settled for him. The case was brought to me, and I looked at the woman's mouth, and there was this condition of affairs: just under the tongue there was apparently a white deposit. An effort to remove it, to scrape it off, failed. It seemed to be an alteration of the mucosa. This came in isolated patches, first on one side of the fraenum, then gradually extending on the other side. These patches appeared on the inside of the lip, on the inside of the cheeks, the mucous membrane. Gradually these patches coalesced until the inside of the cheeks, both sides, under the tongue, the inside of the lips, had this white corrugated appearance. I took a pair of scissors, and as this condition had extended down over the gums, the patient having lost her teeth, I cut off a piece and subjected it to microscopical examination. Microscopical examination showed that the whole mucous lining of the mouth, lips, cheek, etc., had been converted into what, from the microscopical appearance, was practically the same as the skin. I got some plates of it and intended to bring them, as I also intended bringing up something else that might have been of interest, but I came off in a hurry and forgot them. I wanted the gentlemen to examine this condition. I never have seen anything like it. There are in Richmond nine or ten gentlemen engaged in this same work. I asked two of them, and they never had seen anything like it. I mentioned it also to gentlemen from other places since, who I thought would know more about it than I did, and they could not give me any information. I would like to know if any gentleman present can suggest what this was. Microscopical conditions, as I said, showed that the whole mucosa had been converted into apparently the same condition, histologically, that the skin showed under the microscope. When I cut the piece off it looked exactly as if you had cut off a piece of skin and left a raw surface under it, the same as if you had cut away the mucous membrane itself. This had gone on for five years, gradually getting worse all the time.

DISCUSSION ON DR. WHITE'S CASE.

Dr. Donnellan: Mr. Chairman, I never saw a condition such as Dr. White has described, but several years ago Dr.

Butlin, of London, published a book on diseases of the tongue, a small handbook and a most instructive volume, and not only does he give the details of a variety of conditions of the tongue, different forms of the strawberry tongue and blankety tongue, and that sort of thing, and different deposits seen in infectious diseases, such as syphilis, lupus, etc., but he has also described a condition such as Dr. White has described, in which you have had an alteration of the tissue of the tongue, of the mucous membrane, which was analogous to the epithelium covering the external portion of the body. He does not speculate upon its origin or as to what the character of this origin has been, to the best of my recollection. It is several years since I looked over the book, but I was struck with the close analogy between the case he mentions and the one mentioned by Dr. White.

Chairman Renner: I remember a few years ago a case similar to this, in which the thickening of the membrane was confined to the mucous membrane over the hard palate. That is the only observation I have made of any cases analogous to the two that have been mentioned. Is there any further discussion of Dr. White's case?

Dr. Halstead: A case was described once in the Academy of Medicine, of a larynx like this. There was no conclusion reached as to the diagnosis.

REPORT OF AN EAR CASE.

Dr. Phillips: Mr. Chairman, I would like briefly to relate a rather interesting ear case, that came into my clinic at the Post-Graduate school, about a month ago. It was a case of a man who came into the clinic complaining of having received direct violence and being severely injured, and the injury was followed by a hemorrhage. This was his statement in regard to the matter. There was a hemorrhage from the ear, with considerable pain, and I believe his hearing was somewhat interfered with, but he came especially to see what injury had occurred in connection with his ear, I suppose to get legal evidence to be used in an action for damages as a result of his injury. My assistants made the examination. They came to me, and said they had made a diagnosis of a traumatic injury, which had resulted in the fracture of the long process of the malleus, and the examination would indicate that such a thing had occurred. The malleus of the other ear was in a normal condition. The malleus of the affected ear, from the short process downwards and backwards, was in a normal condition. I examined the case very carefully, and had several other men, none of them, however, experienced except my own assistants, and they all said there was every indication that there had been a fracture of the long process of the malleus in this case, and I am inclined to think such a thing has actually happened, although it must be a very rare occurrence. I had never seen it before. Whether it had occurred, I had not taken

the pains to read the literature on the subject to ascertain. It seems to me rather a rare and interesting condition. I might incidentally say that yesterday morning I was called up by the lawyer of the railroad company, who asked me what the present condition of the man was, and said that the suit would be on in a very short time.

A MEMBER: How old was the patient?

Dr. PHILLIPS: About forty-five or fifty years of age, I should think.

Whereupon on motion, duly seconded, the meeting adjourned until to-morrow morning, at ten o'clock.

PAPER:

SYMPTOMS POINTING TO THE NECESSITY FOR OPERATIVE INTERFERENCE IN MASTOID SUPPURATION.

BY WENDELL C. PHILLIPS, M.D.

The diagnosis of suppuration of the mastoid antrum and cells is a subject of much interest to the otologist.

In the majority of cases it is not difficult for one who has had considerable experience to make such a diagnosis. To the less experienced, it is a more formidable undertaking: while to those having no special knowledge of ear diseases the diagnosis is never made until the symptoms have become so apparent that, almost, "he who runs may read" them.

The great importance of diagnosis in this diseased condition cannot be overestimated, and he who makes an early diagnosis renders valuable service to his patient.

In selecting the proper time for operative interference in mastoid complications of suppurative middle-ear disease, the judgment of the operator is frequently subjected to a severe test. While opinions may vary to a marked degree, from operating at the very commencement of mastoid involvement to a delay which may lead to extensive complications, there certainly must be a period in the history of every case when operation should be no longer delayed, and the object of this paper is to endeavor to outline those symptoms which may be looked upon as pointing to the necessity for operative interference. With opinions and experiences so varied, as no doubt have been those of the otolo-

gists present at this meeting, it is not to be expected that the conclusions of any one will meet with the approval of all. For convenience the topic will be divided into chronic and acute mastoid suppuration.

By acute suppurative involvement of the mastoid we mean an extension of the suppurative process from the middle ear into the mastoid antrum and cells during an acute attack of middle-ear suppuration. This is the generally accepted definition. On the other hand, during a chronic middle-ear suppuration there may occur an acute mastoid involvement. This last-named condition is, however, more often spoken of as chronic.

A discussion of the indications for operation upon the mastoid in acute cases is specially fitting at this time, when—partially as a result of the season through which we have passed, but more so as a result of the prevalence of the grip—all practitioners of medicine are being called upon to treat numerous cases of acute suppuration of the middle ear. In all grip cases there is present a large amount of infectious material in the nose and nasopharynx. The characteristic cocci of this infection are the streptococci, staphylococci, and pneumococci. The accompanying inflammation and tumefaction of all the intranasal tissues so obstruct the nasal channels that ordinary blowing of the nose is attended with more or less danger, for some of the infection may enter the Eustachian tube and become the exciting cause of acute middle-ear suppuration—a suppuration which is peculiarly violent, virulent, and rapidly destructive to all tissue with which it comes in contact.

It would seem that physicians in general do not fully comprehend the very great danger to the ear attending attacks of the grip, and it is equally true that much of this langer could be avoided by proper treatment of the nose and nasopharynx during the time of its ravages. To keep the nose and nasopharynx free from infection, or comparatively so, is to render the Eustachian tube much less liable to an invasion of bacilli.

It should be the routine practice in both private and hospital practice to make microscopical examinations of the pus in all acute cases of middle-ear suppuration, and if streptococci or staphylococci are present we know the tendency to mastoid involvement to be much greater than otherwise would obtain. When microscopical examination of the pus is made, the report should state which cocci predominate. It has been rather con-

clusively shown that pus is more virulent when the streptococci are in excess.

Blood examinations also, while not absolutely necessary in uncomplicated cases, may be of greater service when infection of the lateral sinus is expected, and it is strongly urged that in all cases where general infection is suspected such examination should be made.

Other things being equal, knowing the rapidly destructive nature of the pus just described, with its tendency to migrate into tissues far beyond the confines of the middle ear, even to the blood sinuses and brain tissue, the knowledge of this pus characteristic would lead one to operate much earlier than if it appeared upon microscopical examination to be free from this infection. Acute mastoid disease may be described as mastoid involvement appearing during the course of an acute suppuration of the middle ear, the symptoms of which may be described somewhat as follows: Always bear in mind that upon these symptoms must be based one's final judgment as to operation. Perhaps the most marked symptom of mastoid involvement is pain. This pain usually comes on some time after the excruciating pain which precedes suppuration of the middle ear has passed away, and after the discharge from the ruptured or incised drum has been established. It is a dull, heavy pain, not definitely localized like the pain of acute suppuration of the middle ear, but rather diffused over the surface of the temporal bone. Patients frequently describe a feeling like a weight upon the head. This pain is not so severe as in the middle ear, and is located behind and above. With it the patient describes a feeling of fulness, heaviness and pressure over the entire parietal region. The pain may or may not be constant, and may or may not depend upon free or diminished discharge from the external canal, but it is usually present at least to a slight degree. Another prominent symptom is tenderness upon pressure. This tenderness is usually marked at the tip of the mastoid, but is more significant when it is present higher up, just over the mastoid antrum; and more recently we have come to attach more importance to tenderness in this region than to the same condition when lower down at the tip. The mastoid tip may be tender on pressure when no disease is present. Temperature must also be considered, but it must not be relied upon as pathognomonic in any degree in mastoid involvement. In young children, it is usually present and rather high. In adults, even with extensive mastoid involvement, the tempera-

ture may not be particularly disturbed. It must be borne in mind, however, that in certain complications, like sinus infection, the temperature may be very high or subnormal, in which case it becomes a very important factor.

A not unimportant symptom of mastoid suppuration is the facial expression. This expression is not especially one of agonizing pain; the countenance rather is indicative of anxiety; it is altogether an extremely unhappy expression. The head usually hangs forward, with an inclination to lean toward the healthy side. To one whose privilege it is to see large numbers of mastoid cases, the observation of this symptom must become a valuable adjunct in completing the diagnosis. I have frequently, from a row of waiting patients in the clinic-room, pointed out cases suffering with mastoid complication from the facial expression alone.

External periostitis, with or without infiltration of the soft tissues, certainly must be considered as a symptom, although, as a rule, operative interference should be resorted to long before these symptoms appear. When present they must be considered rather as a complication than as a symptom of the disease itself. The drum membrane must not be overlooked in making a diagnosis of mastoid involvement, especially that portion known as Shrapnell's membrane or the attic region. When this membrane, together with the posterior superior portion of the wall of the canal, is found to be bulging downward and forward into the canal, giving it the appearance of being narrowed from above downward, a picture is given which constitutes one of the two most prominent symptoms of mastoid suppuration. The other prominent symptom to which I refer is tenderness upon pressure over the region of the antrum. To define the relation of these two symptoms to surgical interference, I would say that prolonged tenderness upon pressure over the region of the antrum, together with bulging of the atticus tympancius and the superior posterior wall of the canal, constitutes sufficient reason for operative procedure, and especially so when the pus contains streptococci or staphylococci.

Suppuration in the mastoid bone must be considered as a complication of suppuration of the middle ear; but there are many further complications which may and often do complicate the mastoid suppuration. The symptoms of these complications, while not strictly a part of this paper, the scope of which is confined to the indications for operating, may, however, be briefly

mentioned. I refer to rigors, vomiting, vertigo, choked disk, aphasia, paralysis of the extremities, high temperatures, facial paralysis, dull mentality, uneven pupils, so-called typhoid conditions, etc. All of these symptoms indicate that the suppurative process has gone far beyond the mastoid cells into either the lateral sinus, the dura, the cerebrum, or the cerebellum, and when these symptoms are present we know that there can no longer be any possible doubt as to the necessity for operating. It may be possible to have a non-suppurative involvement of the mastoid cells, a mere congestion; but such a condition is hardly probable. The first stage of a suppuration may be a catarrhal congestion, but we must be led to conclude that when inflammation of the mastoid cells is present that involvement is suppurative in character. This opinion is greatly strengthened by the fact that we practically find mastoid involvement only in the presence of middle-ear suppuration. Knowing this to be true, the moment the symptoms of mastoid suppuration become apparent we are face to face with the necessity for a decision whether or not we shall operate. The very early symptoms may be, and sometimes are, relieved by measures other than external operation. Free incision of the drum membrane, carried well through the attic region into the external canal, allowing the escape of pus, will often completely relieve all indications of mastoid involvement. In fact, the whole theory of such relief is based upon the importance of free drainage, so that even when the antrum itself is involved the necessity for further involvement of the mastoid cells is taken away by establishing such drainage. This together with local blood-letting by means of real or artificial leeches, and with the ice-coil or hot poultices, should be abortive in a small percentage of cases. During the early stages of middle-ear suppuration, and even after mastoid symptoms appear, irrigation with hot sterile water is commendable treatment.

Hot douches, when used, should be from 100° to 110° F., and large quantities of water should be employed at each treatment. These treatments should be frequent, the douche being used once or twice each hour.

The great tendency is to make use of these for too long a time: I refer especially to the ice-coil and to the hot poultice. The ice-coil should not be used longer than twenty-four or thirty-six hours, after which time it may become a dangerous application on account of its proneness to mask the symptoms. Continued use of poultices may be almost as bad: in fact, any prolonged at-

tempts to abort mastoid suppuration are to be deprecated. In my judgment the greatest results in the way of prevention are to be obtained from free drainage of pus through the drum, although the other methods should be given a fair trial, providing they are used early in the history of the case.

At the very onset of mastoid involvement the patient should be placed in bed, and he should remain there until all symptoms have passed away; in short, he should be treated as any other patient suffering from a serious disease.

Next to free draining, this procedure should be given the highest place in the list of preventive measures.

External operation should be performed in acute suppurative inflammation of the mastoid cells when a permanent remission of symptoms has not been brought about by free drainage through the drum membrane, or by the application of ice-coils or poultices, or from local blood-letting, and when this time has arrived there should be absolutely no delay in operating—the sooner it is done the better it will be for the patient. The majority of the hospital cases and many of the private cases have already reached this stage before we see them, and it is a mistake to attempt to abort under such circumstances. It is at this very point that many otologists waver, and, by still further delay, complications arise which may make the operation much more extensive and jeopardize the patient's life. Just when the exact time arrives may not be measured by days or hours. The date must be determined by the good judgment of those who have the patient in charge.

Many delays in operating come either from lack of willingness to consent upon the part of the patient or his family or from the extreme conservatism of the family physician. Conservatism is a quality not to be ignored, but when carried to the extreme it reacts to the great detriment of the patient. The same statement may be equally true when applied to radicalism. Indeed, it is quite possible for the conservative to be radical in his conservatism, and of the two it would seem to be preferable that one should be conservative in his radicalism rather than radical in his conservatism.

Another strong point in favor of early operation is the better hearing results to be thus obtained. Early operation usually will be followed by practically perfect hearing on the affected side.

It must not be forgotten that pus pent up in the mastoid cells is in a position seriously to menace nearby vital structures. Not

more important is it to remove the suppurating appendix than to open suppurating mastoid cells.

In my experience, especially in grip cases, the destructive process is so rapid that one frequently has to operate soon after the onslaught of the disease.

A recent experience may serve to indicate what is meant by the above statement:

Case I.—"X.," child, aged eight years, had an attack of grip commencing January 10, 1901. January 12th, pain in the ear began, followed by suppuration. On the 14th pain was relieved until the 16th, when severe mastoid symptoms manifested themselves; by the 19th the mastoid had become very tender, and on the 20th, when I first saw him, the symptoms were so severe that the question of palliation was not to be considered. Operation on the 20th revealed pus not only in the antrum, but in the cells at the very tip of the mastoid, so that three days after the first mastoid symptom the proper date for operating had come. In fact, it would have been better in this case could the operation have been performed a day later.

Case II.—W. W. W., male, aged thirty-two years, had an attack of grip dating from April 1, 1901. During the night of April 4th he had a severe attack of middle-ear pain; April 5th I first saw him and found the drum membrane bulging both in the attic and posterior quadrant. A free incision was made, which was followed by pus and free hemorrhage. On April 6th mastoid tenderness developed; on April 7th he was admitted to the hospital, where the hot douches were continued. He remained in bed during the entire illness. On the 9th, at noon, the mastoid was opened and excessive involvement was found, the bone being softened and necrotic over a wide area, and the lateral sinus was fully exposed during the operation; the pus in this case was found to be loaded with streptococci, staphylococci, and pneumococci. These two cases illustrate the rapidity with which the mastoid may become involved in certain cases.

If microscopical examination of the pus from the middle ear in a case presenting symptoms of mastoid involvement reveals the presence of streptococci, staphylococci, and pneumococci, it is my belief that no amount of palliative treatment will have any effect upon the final result, and we usually find this condition in grip cases, so that it would seem wise, especially in this class of cases, not to delay operative interference; this is especially true if streptococci predominate. I do not mean to be understood as

advocating an operation during the first few hours of mastoid involvement in the cases referred to above, because during that time palliative measures should be resorted to. It is agreed by many operators that even if pus be not found no harm has come to the patient from operation, as a patient always recovers; but to me this argument does not appeal. It is unfair to subject a patient to an operation simply because it will do him no harm. In mastoid operations it is necessary that we positively determine mastoid involvement, after which there should be no hesitancy as to the necessity of operative interference. It is possible that to delay operative interference may not result in great danger to the patient, and occasionally an apparent temporary recession may be obtained, but even under these circumstances the whole trouble may light up anew at any time, making operation necessary, and delay of this kind must be attended with more or less danger of still further complications, many of which are attended with serious menace to life.

With such views as have been expressed in this paper in favor of early operative interference one might expect that in a large hospital service a fair percentage of the cases operated upon would reveal no pus or diseased tissue; but so far as my own experience is concerned this is not true; neither is it, I believe, in the service of others in the large hospitals.

During the last season I have not failed to find pus or necrosed tissue in a single instance.

The method of operation adopted should carry out this one prime necessity, namely, that all diseased tissue should be removed. The location of the incision, its length, and the method of removal of the external table may vary, but these variations are not of very great importance so long as the vital point above mentioned is carried out.

It is not the purpose of this paper to enter far into the domain of treatment, but it has seemed wise to call attention to the necessity for thoroughness.

A word or two in regard to the Wilde incision: Aside from such benefits as come from local blood-letting, nothing may be expected from this incision except the annoyance of having an open wound to contend with in a nearby location. To me the Wilde incision has always seemed a very wild incision to make. It has been stated that if upon making the Wilde incision the external table seems healthy no attempt should be made to enter the cells. Experience, however, does not bear this out, as patients

suffering from mastoid involvement should be given the benefit of operative relief long before the disease has progressed far enough to break through the external table.

Local blood-letting may be obtained by much simpler methods, and there can be no necessity for ever making a Wilde incision.

Chronic Suppuration.—Long delayed suppuration of the middle ear attended with involvement of the attic, and possibly the antrum and mastoid cells, may lead to the necessity for external operation in order to overcome the suppurative process. This is especially true in cases of chronic otorrhea, the discharge of which is offensive, and with the presence of cholesteatomatous masses and carious bone. Only by external operation in many instances are we able to indulge in any hope of permanent relief. That a chronic otorrhea is attended with more or less danger to life will not be denied. Such danger may not be great, and fatal cases may not be frequent, but the danger still exists. It is well known to most of you that life insurance companies at the present time refuse absolutely to accept as risks any persons who suffer from chronic discharge of the middle ear. An attempt should certainly be made to cure permanently all cases of chronic otorrhea. Local measures—removal of the necrosed ossicles and of other known methods—should be made use of before resorting to external operation.

PAPER:

INFLUENZA AS A CAUSAL FACTOR IN ACUTE MASTOIDITIS AND EARLY TREATMENT.

JAMES MC CAW, M.D.

The importance of the relation of influenza or la grippe to acute mastoiditis has been fully demonstrated, to my satisfaction at least, by the number of cases coming under observation within the past few years. Reviewing the literature of acute mastoiditis, one is impressed with the fact that the large majority of cases are associated with or immediately follow epidemics of influenza. To be clearly understood, I will state in the beginning that it is accepted that mastoid complication following influenza is consequent upon tympanic infection; therefore, in all of these cases we have to deal with a tympano-mastoiditis. I am convinced that the mastoid antrum at least is involved in most, if not all, grippal infections of the middle ear; the further extension would seem to depend upon the character and virulence of the infection, and possibly upon its association with other infection, the age of the patient, and our proper estimate of the early treatment. Influenza is defined as an infectious disease due to Pfeiffer's bacillus, and characterized by inflammatory symptoms of the respiratory tract, digestive and nervous systems, accompanied by prostration and a marked tendency to complications. The conditions found in the upper respiratory tract concern us most, on account of the direct bearing upon our subject. The phenomena found here are irregular; in some the mucous membrane is thickened, irritated, and swollen; pain and discomfort complained of, out of all proportion to the appearances; in other cases we find a more intense congestion of the mucous membrane, less swelling, and a tendency to the formation of small blood clots here and there over the surface. I speak of these to call attention to the fact that the writers in his experience has found practically the same peculiar differences in middle-ear complications following grippal infection, and which we think have a direct bearing upon the character of the mastoid involvement. It has been my good fortune to see, in the last three epidemics of influenza, a large number of cases of complicating otitis media and mastoiditis, and I have been

forced to the conclusion that there is a great difference in these two varieties of infection. The former is apt to come on during convalescence or following the attack; the patient complains of an uncomfortable feeling in the ear, gradually changing to severe pain in from twelve to twenty-four hours. Examination usually reveals the membrana tympani moderately congested, no decided bulging, and, to all appearances, a mild case of otitis media. From this time on the character of the case changes; there is developed mastoid tenderness on deep pressure, or the slightest suspicion over the tip, or it may be absent entirely. Bulging of the membrana flaccida becomes very pronounced, and the pain excruciating. There is in these cases an almost simultaneous invasion of the tympanum, antrum, and cells with the infectious and suppurative process, and their integrity is rapidly encroached upon. After incision of the membrana tympani, regardless of the thoroughness with which it is done, there is a continued copious purulent discharge. The amount and rapidity of pus formation is astounding. The incision fails to take on a reparative process, the lips remain open, pouting, and, in some, necrotic, the whole picture giving one the impression of a very active suppurative process in tissue of low vitality. *I have seen very few of this type of cases escape an active and rapid involvement of the mastoid.* The latter variety we find coming on more often during the attack; the patient complains of sudden, severe pain in one ear, followed, it may be in two or three days, by the same in the other. There may be a slight, blood-tinged serous discharge and some mastoid tenderness. Examination in these cases gives us an entirely different picture; the membrana tympani is intensely congested, with small hemorrhagic areas over its surface, which appear to be between the layers of the membrane, giving it the appearance of marked bulging. I have seen this hemorrhagic condition extending well along the cutaneous covering of the bony canal. These cases, while to all appearances they would indicate a much more severe condition, in the writer's experience have yielded more readily to conservative measures of treatment. Influenza, as a causal factor in tympano-mastoiditis, is being recognized, and its importance given much consideration by some of our best observers. Kyle, in a paper read before the Southern Section of this Society, last December, is very explicit on this point. He says: "This infection has a curious way of affecting and penetrating certain tissues, cavities, and locations of the mucous membranes which is peculiar to itself. I

have seen, following the attack of la grippe, or associated with it in most rapid succession, an involvement of the middle ear, this involvement being of an infectious nature and rapidly going on to suppuration. I have seen both middle ears involved, with associated involvement of both mastoids, the involvement being rapid and virulently infectious." Knapp says: "The grippe is a frequent cause of mastoid caries," and reports a number of cases in support of his views.

A point of great importance to be kept in mind in dealing with this particular infection is the great rapidity of its progress and its usually virulent nature. The writer called attention to this fact in a paper read before the Jefferson County Medical Society, July, 1900, and published in the *Laryngoscope*, February, 1901. I can do no better than quote my words at that time: "There is great necessity of a thorough examination in all cases of suppurative middle-ear disease, with a view of determining the extent of the process, and especially so in cases complicating influenza, as I have come to look upon this particular infection with greater anxiety regarding the dangerous complications than any other we have to deal with. When once beyond the tympanic cavity its virulence is shown by rapid destruction of the mastoid walls, and if not relieved by surgical interference it is apt to involve the meninges and brain in a purulent inflammation."

In my humble opinion, I believe la grippe infection is responsible for more cases of acute suppurative mastoiditis than either scarlatina, measles, or diphtheria. My clinical experience bears me out fully in this statement. The results of Perez, in his recent experiments with Pfeiffer's bacillus to determine the influence of virulent cultures upon traumatism, do not agree with clinical experience. He made a number of inoculations—150 injections in all—into the different cavities and organs of the body, and in all obtained equally unsatisfactory results. The peritoneal and pleural cavities, brain, eye, ear, and joints were all successively injected. But five cases of purulent otitis occurred after twenty injections of the middle ear. From his results the author expressesthe belief that Pfeiffer's bacillus does not cause infection, but an intoxication, and its pathogenicity is due to a toxin. This may explain the difference in the different varieties of tympanomastoiditis referred to above; it may be that in one we have an inflammation due to the inoculation of the Pfeiffer bacillus alone, whereas in the other variety it may be associated with a pyogenic organism, and the virulence of each thereby increased. The rap-

idity of the invasion and destructive process would indicate some such combination of influence. Although a great deal has been said and written the past few years on the early or abortive treatment of acute mastoiditis, it would seem to me that from the number of different views and different methods employed there is still ground for discussion. I have used the Leiter ice-coil or ice-bag, advised by McKernon; heat externally and hot douching, advocated by Roosa; leeching, as recommended by Bacon, with rest, cathartics, etc., and found each has its advantages in certain selected cases. I would strongly emphasize the fact that in the early treatment of these cases we should not expect to take any one method and apply it indiscriminately to every case of acute tympano-mastoiditis that comes under our observation any more than we would take one method and apply it in any other class of cases. Great care should be exercised in selecting our cases for this or that method of treatment, for much depends upon good judgment in the early stage. This fact alone, I think, will explain in a measure the great discrepancy in the results obtained by different observers when using the same line of treatment. If we see these cases early, and can separate them into the types which I have endeavored to make clear, much can be done in an abortive way. My best results have been obtained in what I will term the hemorrhagic type, by rest in bed, free catharsis, leeching in front of the tragus and over the mastoid, and hot douching of the canal every two hours. I do not here incise the membrane. The writer is well aware that this method of hot douching has been severely criticised, and it is said the tissues macerate, making perforation more liable; but in my hands this has not been the case, and I have found that it has given me the largest percentage of recoveries. These are the cases wherein I feel we are justified in applying abortive measures. It is my impression that in this variety of acute otitis we have the same condition of the mucous membrane of the antrum, and possibly the cells that we find in the tympanum. Whether my impression be true or erroneous, a considerable number of these cases recover under abortive treatment, be it ice-bag heat, or leeching.

In the other variety, or that of grippal infection with suppuration, the writer is equally radical as he would appear conservative in the hemorrhagic variety. From the fact that suppurative influenza otitis almost always runs an acute course up to the inception of the dangerous complications, and being convinced that the antrum is early invaded by the suppurative process and, in

rapid succession, the mastoid cells, I do not feel justified in prolonging conservative treatment. Early and free incision of the drum membrane, warm douching every two hours for cleansing purposes, rest, and catharsis, constitute my early treatment. In my experience if this does not yield palpable results in thirty-six to forty-eight hours, the case will be one for surgical interference. To prolong conservative measures is to jeopardize the welfare of our patient. The writer is convinced that it is not a wise plan to apply the ice-coil in any case where the mastoid is involved in a purulent inflammation, from the fact that it will mask the symptoms and lead us astray in estimating the extent of the process, and before it is realized our patient is beyond the border line of safety. I think each one of us, in operating early on acute cases, must have been surprised to find the amount of destruction which had taken place in so short a time. I have seen the entire mastoid in a purulent and necrotic condition, with involvement of the facial nerve and complete facial paralysis, in one week from the first ear symptoms. It is generally agreed that pyogenic disease of the mastoid is a dangerous condition; therefore, if we feel satisfied that such exists it is, I believe, our duty to immediately open the mastoid cells and not try to palliate or abort an already dangerous condition. In those cases where we are in doubt and where conservative treatment has proved inefficient, it would seem that an exploratory operation, spoken of by Dench at our recent annual meeting, would be justifiable. The operation, *per se*, is practically devoid of danger in the hands of an ordinarily skilful operator, and, aside from the cosmetic effect, I can see no valid objection to it.

In conclusion, I wish to emphasize the fact that in influenza we get two distinct types of tympano-mastoiditis: First, the suppurative, which invades the tympanum, antrum, and cells almost simultaneously in an unusually virulent and destructive process, which calls for early surgical treatment and in which abortive measures are contraindicated. Second, the hemorrhagic, with very pronounced symptoms at first, but which yields readily to abortive measures, and, in the writer's experience, only about 5 per cent. go on to suppuration requiring radical interference.

DISCUSSION.

Dr. KIRKENDALL: Mr. Chairman, the subject for discussion seems to me to be a very important one. In speaking about abortive measures, I believe, as the last reader said, that when we have

an involvement of the mastoid abortive measures should be avoided; but I am not willing to believe that in any bacteriological case, where we have infection with bacteria of any kind, that we should use heat. I am a thorough disbeliever in the notion that we can derive any benefit to our patient from the use of heat in any way, shape, or manner. I read a paper on that subject before a medical meeting in Ithaca, and one of our very best pathologists at Cornell University came up, and I was very pronounced in saying that I did not think that in bacteriological infection, such as streptococci, pneumococci, etc., that heat should be used. This gentleman came and congratulated me, and said, "Doctor, I thoroughly agree with you. I cannot understand why physicians should use heat where we are sure we have any suppurative or infectious disease." Again, speaking of the symptoms, I had a case recently where a student, who came to me after heat had been applied for two weeks, following measles. He had no pain in the process at all, over the antrum or the tip, the only symptom of mastoid invasion he had being the building of the posterior wall; but he had a large amount of pus. I sent the pus to the bacteriologist, our bacterial examiner, and he pronounced it streptococci and pneumococci, and I advised an operation. As I said, the patient had no pain behind the ear, and the only symptom was the building of the posterior wall. He wrote his father, and his father saw the family physician, who said he had been in practice twenty-five years and never saw a case of mastoid disease in his life, and he had treated many cases of suppurative middle-ear disease, and did not believe it amounted to anything, and word came back to that effect. After a few days the boy was quite decided that he had trouble there that was serious, yet he was attending the university and doing his work at the university there every day. I had nobody there to consult with, and I told him he had better go to New York and consult a friend of mine, which he did. He was operated upon at the eye and ear infirmary in New York. He had no fever, he had no pain behind the ear. He had no protrusion of the auricle, he had only this one symptom that was visible, but they found two ounces of pus, a sinuous abscess with two ounces of pus. I am perfectly sure that we have not got to see every hair on the horse to know it is a horse.

Dr. WISHART: Mr. Chairman, suppose we grant, as the last speaker has said, that heat should not be applied in these cases where there are bacteria present, how are we to decide in the early stages that these cases are not those in which you can use heat? I would like to ask the doctor that question. I think there is a very important bearing in it. If we have an opportunity of examining the discharges, the secretions, and find out that there are bacteria present, we will be quite right in avoiding the application of heat, but if we have not that opportunity, are we to do without the application of heat, which, in my experience at least, often gives great relief to the patient?

Dr. Thompson: Mr. Chairman, if the Section will pardon the introduction of a topic that has not been mentioned in the paper, I would like to ask a few questions. All of these papers on the treatment of the acute mastoid diseases universally omit any reference to the after-treatment of the case. Where you are making an operation for an acute mastoid trouble it is possible, in some cases at least, to preserve almost normal hearing in the ear and in almost all acute cases to preserve at least one-half the hearing power. I have one patient operated upon for acute mastoid trouble more than four years ago where the hearing for the watch in the ear that was operated upon is just as good as in the other ear. The hearing is normal. My own method of after-treatment in these cases is to pack the external meatus with gauze, and pack the wound back of the ear with gauze, and keep that dressing until the wound heals. I usually find on making the second dressing, on the fourth day, that the piece of gauze in the external meatus is entirely dry. In other words, the great amount of pus we get in these acute cases has an outlet. Whether other men are using this method of after treatment and getting the same result in acute cases or not I do not know, but I do know that in my own cases I have succeeded in saving a very large percentage of the hearing power, where the cases have been operated upon for acute involvement of the mastoid cells. Personally, I do not irrigate the wound after the operation is completed. I believe in doing so you are simply keeping up the trauma and the irritation in the tympanic cavity, and lessening the chances of your patient's having good hearing power after the operation is complete. Of course, in the radical operation, where you clean out the tympanum thoroughly to check the chronic suppurations, this course does not apply so well, but in the acute cases I think this plan of after-treatment I have mentioned is the best possible and I would like to know what the essayists agree upon as the plan for after-treatment, what treatment they follow, and what result they get as to the hearing in the case.

Dr. Seiler: Mr. Chairman, I believe the old saying is the proof of the pudding is in the eating, therefore, I rise to make a few remarks because I am over just exactly such an attack as has been described in the two papers, what is called grip, and I have been able to observe, in my own case, in my own person, the symptoms and the gradual coming on of the middle-ear complication and the mastoid complication; and, in spite of all temptation, as old Pinafore has it, I did not find it necessary to open the mastoid, for the simple reason that there was no inflammation. In fact, none of those cases have inflammation, neither have they pus, whether the bacteriologist pronounces it this, that or the other cocci. They must either have strabismus, or the microscope must be crooked. Still further, which I think is the proper idea, the micro-cocci and pus have nothing to do with each other except that the material gives the cocci food. The exudation from my ear, which I carefully examined after the membrana tympani had

been ruptured and the pain temporarily relieved, consisted of nothing more than pure, simple mucous. There was no pus about it. Then a peculiar condition, which is also very important to notice, namely severe nerve excitement and shock, brought on a relapse of the conditions, the general grip condition, and with it not only an infiltration of the mastoid cells, as indicated by the usual external symptoms, but a complete closure of the external meatus, so that it was utterly impossible to get anything into the meatus. In spite of all that, I used what has not been mentioned in the papers, namely, abortive treatment. I do not call the application of heat or of cold, or this, that and the other, abortive treatment. Abortive treatment is the internal adminisrtation of a remedy which will destroy the toxine which gives rise to the whole trouble, and the grip is a toxine or produced by a toxine originally, due to a change in the nervous system somewhere, a peculiar change. Of that I have not the slightest doubt. I think those who have carefully observed the many manifestations of that so-called grip will bear me out that it is a toxine generated within the body, and has nothing whatsoever to do with bacteria. If the gentlemen who so learnedly described these things will look in the fourth edition of my book, which is now out of print for five years, they will find expressed pretty much the same opinion as I have expressed now.

Dr. Donnellan: I should like to ask Dr. Seiler what the antitoxine is to which he refers?

Dr. Seiler: I thought everybody knew it. Dr. Kaliska, of St. Louis, and I concocted it at the meeting at Cincinnati, in 1885, when we were the only two who had originally observed these cases. He called it, strange to say, "It," the same as I did, because we had no better name for it. It would not fit any other known disease. Instead of listening to a lot of discussion on indifferent subjects to us, we adjorned to the hotel that afternoon and discussed the matter thoroughly, and came to the conclusion that the old-fashioned, long-put-on-the-shelf remedy, or drug, if you choose to call it, which is absolutely harmless in every respect, but is an absolute specific to the so-called grip, is benzoate of soda in large doses. While I was suffering as I was, using half a grain of morphia, hyperdermically, giving me only half an hour's relief, and lying down was out of the question, in three days, taking benzoate of sado every hour regularly—and, in fact, I took it whenever I happened to think of it—and I know that I finished pretty nearly a quarter of a pound of chemically pure benzoate of soda in those three days, and, strange to say, it acted upon a chronic, rheumatic and gouty condition, which I have been suffering from for the last eighteen months, in exactly the same manner as the salicylate of soda without the inconvenience that involves and which I made observations upon and embodied in the paper. Benzoate of soda, in ten-grain doses, given every hour or two hours is the specific, together with rest in bed to keep down, or rather assist the heart in overcoming the depression

produced by the toxine. You will find that most of the cases of heart failure which are so extremely frequent in epidemics of grip are due to the fact that no heart stimulant has been given, and that the patient has been allowed to assume the upright position too soon. That is my abortive treatment.

Dr. Ingersoll: Mr. Chairman, the advisability of an early operation in these cases was very forcibly impressed upon me a few weeks ago. A child was brought to me or sent to me by the family physician, a bright boy about twelve years old, who had been suffering from an otitis above five or six days, and the family physician had taken care of him. Then, there were evidently symptoms of mastoiditis, and he was referred to me. At the time the child had a temperature of about 100, a very slight tenderness over the mastoid antrum, and a slight discharge from the ear. I saw him every day for three days. The temperature went down to normal, and I treated the ear locally, and the discharge from the ear ceased. The other symptoms seemed to bear out the conclusion I reached that the process was clearing up, because the child was apparently well. The parents could not keep him quiet, and I thought that possibly the mastoid process was at least improving and tending to get well. Three days later the boy was brought back to me, and his temperature had gone up to 102 and there was marked bulging over the mastoid antrum, and I urged immediate operation. Upon opening, I found not only the antrum, but the mastoid cells were full of pus, and the boy was suffering from mastoiditis. Had he been operated upon when I first saw him the force of the disease would have been lessened. The boy when I last saw him, in the hospital, was apparently making good recovery. I think we are justified in operating even when the case is apparently improving. We are not justified in operating simply because it will not do the patient any harm, but because, as a rule, the chances of the patient's rapid recovery are better in an early operation.

Dr. Ward: Mr. Chairman, the two papers just read are such a complete exposition of the subject that but little is left to be said. The operative indications far mastoid are largely a matter of judgment. As Dr. Phillips has said it is hardly fair to inflict an operation unless the indications are very strong. I find that where the mastoid shows symptoms of involvment, and where the bacteriological examination shows the streptococci or bacillus of grip, that the abortive traetment is almost absolutely contra-indicated. It is dangerous, absolutely dangerous. While the cases may, in a very small percentage of cases, tend to recovery, it is absolutely dangerous to practise abortive treatment. You, however, will find in the streptococci and the simple catarrhal affections of the mastoid, that it is here we can practise the abortive treatment. I think that the time limit in cases of this kind is considerably beyond what has been laid down by the two essayists, thirty-six hours. In a hospital where we have a great many typhoid fever cases and quite a good many mastoid involvements

I find that many of these cases tend to a recovery from the abortive treatment, and it is the exception to have to operate. In an experience of six or eight years, I think I have only had to operate on about four cases of mastoid involvement complicating typhoid fever. I have followed out the abortive treatment with the application of ice even three, four and five days, as long as there are indications of the abatement of the inflamation. This is not a positive evidence that the trouble was aborted because these conditions often go for months and even years without the positive indications of the necessity for an operation. I have a case now under observations with streptococci infection with mastoid involvement. The indications for the operation were positive but I was not able to get the consent of the patient to an operation. This was more than two months ago. The patient came into my clinic only yesterday with the symptoms still present and still more urgent and has consented to be operated upon as soon as I get home. This was a case of streptococci infection and the patient was able to work now for almost two months, but I am positive that there was pus.

Another thing Dr. Phillips mentioned that I take exception to and that is the use of leaches and blisters in mastoid inflammations. I never can quite convince myself how the extraction of blood from the superficial surface will affect an inflammation in the deep structures in the bone. There are some very good people who believe this to occur, I admit, but it never quite appealed to my judgment in the matter. I think that the blisters and the extraction of blood produce a tenderness which is very misleading and which I would much rather were absent.

Dr. Seiler: Mr. Chairman, there is one point, if I may rise again, to which I would like to advert. The gentleman who just spoke remarked that he could not understand how either the extraction of blood or causing blood to rush to the surface at a given point could affect the circulation of the deep seated structures. If he will inspect water works of any kind he will know that if you draw water to one place it must come from another. It comes from the most easily attainable source. The reservoir or subreservoir where there is more water than is needed, or in case of the body, where there is more blood than is needed. Upon that depends entirely the action of counter irritation and of bloodletting, the drawing away of the superabundance of blood in inflamed parts. It is a matter of hydraulics. (Applause.)

Dr. Blaauw (invited guest): Mr. Chairman, as you called upon your guests, I take pleasure in saying a few words. It has been suggested that in all inflammations of the middle ear where the mastoid gets involved we should call in the otologist if possible, and especially in cases involving the bone that we should not leave those operations to the general surgeon. At a meeting like this of such well-known otologists it may be rather out of the way to express such an opinion but I think that coming from such a body as this the general practitioner will the more readily

listen to it. I do not care to go further into the region where the utmost care has to be used and where we have to know all the possibilities which a general surgeon may not know. Why we should not use heat in the beginning of the mastoid involvement is something I cannot understand. There is one question I should like to ask, and that is, how we can think about an infection of influenza depending upon toxines, absolutely without microbes.

Dr. Eugene Smith (invited guest): Mr. Chairman, I am obliged to the society for its invitation to guests to speak on the subject that is before your society for discussion. I want to thank the essayists for two very good papers on the subject that is being discussed. I may speak from the point of view of the general surgeon, and I will therefore have to beg pardon for intruding upon territory that is beyond doubt especially within the province of you specialists, otologists. Listening to the discusssion this morning I am rather impressed with the similarity of the discussion here to that which will arise in a body of surgeons upon appendicitis. Some of us are radical upon that subject and argue that an appendix once attacked should be taken out. Others are conservative and say that an appendix once attacked should be regarded suspiciously, and should be taken out on future development of trouble, while still others are ultra conservative and say that the appendix never makes any serious trouble and can always be treated from a palliative point of view. On the treatment of otitis media and its developments and the sequelæ that we have had outlined here this morning, notably the carious and necrotic processes attacking the mastoid region, the bony cells, there can be no doubt that many cases must be treated surgically while some may be treated palliatively or from the point of view of the abortive treatment mentioned by Dr. Seiler. We know that infections in general surgery are not always followed by dangerous outcome, while some infections, depending on the virulence of the bacteria, the number of the bacteria invading, the peculiarity of the patient and his susceptibility, are always followed by destructive processes, the same conditions in other patients seemingly not being followed by the same amount of destructive process. That brings us then to the discussion of cases which do not need radical treatment and those which do need radical treatment. I should say that when pus is present in the mastoid cells and has been present a long time, in other words, in the description Dr. Phillips gave of chronic middle disease and its sequelæ, always operate, invariably operate; and if you do not operate, as I will show, sometimes later a dangerous explosion will occur. In other cases where the symptoms may point to a serious condition of affairs, there is still not the absolute necessity for operation that some men will argue. I do not say that operation will do harm in those cases, but in many instances in which two or three men, judging that an operation is necessary, say so and the operation is not performed for any reason, perhaps because the patient will not allow it, we find that such cases do get

well without operation. That we know. The same thing happens in appendicitis. Not every case is followed by death. In certain forms of the disease there may be a recovery while in the perforated or gangrenous form the patient always dies. Now, while the doctor attacks vigorously all the suppurative cases of the acute or fulminating variety, he evidently depends on palliative treatment in the other 95 per cent. of cases. I think that is a conservative way to put it, and back up what Dr. Phillips has said as to the other five per cent. of cases in which destruction is sure to result. From a general point of view I see as a surgeon at times sinus thrombosis of the septic variety. In cases that have long been treated palliatively for middle ear disease when they reach that stage it means that there will almost invariably be such a hopeless involvment of the head, not alone the mastoid cells, as to make cure impossible. The case I will mention was at the Emergency Hospital, of a young man who had a compound comminuted fracture of the skull. Trephining, removal of the depressed bone, drainage, seemed to do the man all the good we see in many such cases. He was getting well. The indications pointed to middle ear trouble. At the end of the week he developed obscure septic features and there were notably symptoms of brain depression. I trephined first one side of the skull looking for brain abscess and opened into the lateral sinus, plugged it and that side did well thereafter, and within a week did the same on the other side, all this under consultation, with a view to do that man the most good possible. I did not find in either mastoid region anything which would enable me to effect a cure, although I found evidences of his own suppurative trouble. There was pus there, and the middle ear condition showed itself within a week by a profuse suppurative discharge. He was not hurt in that region at all. He died at the end of another week. Unfortunately we could not get a post-mortem. The man lived in Rochester and I tried to have the widow allow a post-mortem made there. It seemed to me that in such an interesting case from the point of view of pathology that a post-mortem would have been of considerable benefit to me at least, if not to others. I could not, however, get his people to agree to it. I still think they rather hold me responsible for his death in that he had three operative procedures, first for his fracture, which fracture was accidental, I am glad to say; I did not do that for him, and then for the trephining operations which followed. They were made in the hope of saving his life, and as I say under consultation. Middle ear trouble in youth, breaking out and causing death, when a man twenty-two or twenty-three years old, suffers a compound comminuted fracture of the skull, you can see that was enough to kill him, but I think if he had not had middle ear disease he would have got well.

As to bacteriology, is it a fact that bacteriological examination of discharge from the middle ear is proof positive of what started the trouble? We do not so consider it in general surgery.

A bacteria that enters the abdomen to-day is obscured by a bacteria that thrives in the same medium and that enters a little afterwards or at the same time. If we get streptococci, staphylococci and pneumococci and the colon-bacillus in the abdomen, we are not sure which one started the trouble, but we do know that when the streptococcus is present the infection is more dangerous.

There are other points I made note of in listening to the papers, that I scarcely dare speak of for fear of treading upon ground that is too uncertain. As to danger of operation I would put that with the danger of operation in every case no matter how trivial. I do know of cases of death following mastoid operation. I had one of your respected brethren tell me of a surgeon who performed an operation and the patient died. He does not know what he died of, and he made up his mind he would never have a general surgeon do it for him again. I see a case where it is my duty to operate and some one else declines on the ground that it would be better to delay it awhile, that it is not necessary, and I would attack pus in that region as soon as I would attack it anywhere else,in the peritoneal cavity, in the thoracic cavity or in the cranial cavity. (Applause.)

Dr. White: Mr. Chairman, I did not intend to say anything but the gentleman who has just taken his seat brought up a matter which reminds me of a case I had eighteen months ago, in which the family physician opposed operative procedure in the case. All the evidence pointed to mastoid trouble, although the discharge from the ear which the patient had had off and on for a number of years had entirely ceased three or four months prior to his being brought under my observation. He suffered a great deal of discomfort, general headache and pain, and there was a hard dense swelling below the ear running down to the neck. The family physician had had an exploratory incision made some time before bringing him to me, without finding any pus. When he was brought to me my diagnosis was mastoid disease with pus underneath the fascia, and I decided to operate. The family were very much opposed to an operation. The family physician himself wa sopposed to it. He resolved to have the blood count taken. He had two bacteriologists make the investigation for him. Both reported positively there was no evidence of pus. In spite of that fact I insisted on the operation. I opened the mastoid, found no pus in the upper part of the mastoid, although when I came to the top I found it full, and below the top I emptied out probably four or five ounces of pus accumulated under the fascia, running down to the neck. In following it down I had to make the counter opening down low in the neck. This case is no special interest. Others have seen just such cases as that; but I refer to it simply because the blood count was mentioned in regard to finding the presence of pus. According to both these experts the blood count showed as far as it could do it, that there was no pus present, and in spite of that I insisted on an operation, and found more pus present than in any other case I ever operated upon in my life.

Dr. Phillips: Mr. Chairman, and Gentlemen, I think Dr. McCaw and myself ought to feel greatly flattered at the reception of these papers and the free discussion which has followed, but it only shows how intensely interested men who are laboring in the field we are working in are in this subject. It would be impossible for me to close this discussion and touch upon the points which have been suggested here, in five minutes, but I will do the best I can and if you get tired you will call me down and I will stop at any moment. I wish to endorse one statement made by Dr. McCaw that in his judgment grip was the cause of more cases of mastoid involvment than scarlet fever, diphtheria and measles. I believe his statement was none too strong. I believe it is the most potent influence to-day that enters into the causation of mastoid disease. In answer to the statement made by Dr. Kirkendall, I want to say that the doctor's statement, in my judgment has an element of truth and a good deal of that is very far from the actual fact in connection with the use of the hot douche in the middle ear. To begin with, the temperature of the douche ought to be far beyond the temperature necessary for the propagation of bacteria. It ought to be at a point at least where it would destroy bacteria. If we put our instruments into water which is anywhere above 100 to 110 we are practically going to destroy the germs if we leave them there long enough. I have heard it said that a temperature of 110 would destroy bacteria. The temperature of the hot douche ought to be from 109 to 110, as hot as the patient can possibly bear. But aside from that, as Dr. Seiler said, the proof of the pudding is in the eating, and any man who has had an extended experience with the hot douche in acute suppuration of the middle ear, will bear out this statement that it is of very great benefit. I do not altogether know how to account for it, but my judgment is this, that in douching out the ear every two hours you wash out a million bacteria for every one that you cause. You are clearing the field of the bacteria that are present, and in getting it thoroughly clean you are getting rid of more infection ten times than you might possibly cause as the result of the hot water. In any event it does reduce the inflammation, you may be positive of that, because no one can use it as it is used in our large hospitals continuously without coming to that conclusion.

Something was said, I do not know but that by Dr. Kirkendall, on the question of pain on pressure. There is something in the statement that the doctor makes, but one must study this question of pressure upon the mastoid. I have had a case during the present year of extensive mastoid involvment where there was almost no pain on pressure. I think it is only once in a while that that occurs and that it is rare that the symptom will fail. I still believe it to be one of the most positive symptoms of involvement of the mastoid. But there are occasional cases where you only get it on deep seated pressure. One of the speakers men-

tioned adrenaline, but as an abortive agency I should have some doubt as to its efficacy.

It is a great remedy. Before you put your patient under ether get the adrenaline into the middle ear. You can do the work in half the time, can see twice as well and it is a great help indeed.

Dr. Thompson has brought up the question of after-treatment. Neither paper described after-treatment because that was not the title of the papers. I am glad, though, if the society will allow, to make one or two statements in regard to the after-treatment of mastoid diseases. If you operate soon enough in an acute involvement of the mastoid you will in all probability get a result of perfect hearing. I think the statement will go without question that if your case is so extensive as to involve the middle ear to such an extent that you have to remove the auricles during the operation, which does very often occur, then, of course, you are going to lose your hearing. That is another argument in favor of operating early in cases of mastoid disease. The opportunity of saving the hearing of your patient is in direct ratio to your early operation. Delayed operation means loss of hearing much more than in those cases where you operate early. The after-treatment outlined by Dr. Thompson is the one we use in the hospital in New York. I agree with him that if you are dressing a mastoid wound you take out the old dressing and put in the new, clean the outside of the wound, and be careful not to introduce outside elements unless you are having a large amount of pus. Take the old dressing out, and if the wound looks clean put in another and let it alone, do not interfere with it. Always pack the external ear until the evidences of pus have subsided.

As to Dr. Seiler's statement that pus and grip have nothing to do with each other, I am not a pathologist and make no pretension to be, but there is one thing I know, and that is when you have an involvment of the middle ear in case of grip, you have pus and it is pus that comes out of the ear, and it is pus that is there all the time. Dr. Seiler has made a careful study of Dr. Seiler's case. He has had one case in his own experience and he tells us it was not pus. I do not know whether he examined it under the microscope or not. He says it was not pus. That does not affect the general cases that come under our care. They are all pus, every one of them. (Applause). If they are not pus I will get out of the pus business and give up; but they are every one of them pus and it is the most virulent pus that you get in any case. If it is not pus it is something that looks to us like pus. We think it is pus and call it pus. But I am not a pathologist and never examine anything myself. I keep away from the microscope. I trust to those who know more than I do about it. But the statements that come back to me from the pathologists are that the pus contains so and so.

Dr. Ward takes perhaps a little more conservative view than we do, but he has had under his care an entirely different class of cases, from those that come to us in our special hospitals—

typhoid fever cases. I operated upon two cases within five or six days, with extensive involvement of the mastoid cells. I believe we have those cases and believe we have them frequently.

Dr. Ward raised the question of leeches. Dr. Seiler, I think, made no explanation of the benefit of the leech. I must say, gentlemen, that the longer I work the less I use leeches and the less I use anything except the hot douches or the ice coil. I think it is pretty wise treatment as a rule to let the case alone and watch it, and if the case is going to get well it wil get well without any treatment except the local treatment of the ice coil and hot douche. I would use one of those two. The longer I work and the more experience I have the less apt I am to use any of these other remedies. The internal medication I fully agre with. I think we ought to resort to it. But about grip, if my case is under a general practitioner I will help him all I can and if I think he needs external treatment I give it. We give every case mercurial followed by saline cathartic. I think Dr. Seiler is right that grip is amenable to certain medication, but that is within the province of the general practitioner.

As to whether an operation should be performed by the general surgeon or the otologist, I think we all greatly enjoyed the talk that was given to us here this morning by a general surgeon on this matter. The general surgeons all through the country must be prepared and must be ready to do this operation. I think my friend will fully agree with me that those of us who have had larger opportunities ought to do this and ought to do it more skilfully than the general surgeon. The general surgeon, my experience is, does a good fair operation, a good, fair safe operation. But if I had to have the mastoid operation done on my own head with a brain complication or a sinus complication I would prefer to have it done by some man who had special skill and special training in it. The doctor who was talking to us I think takes a rather more conservative view of it than I should. He does not quite realize the special danger of the grip. Then the doctor compared pus in the mastoid with pus in some other part of the body. Pus in the mastoid is in a very dangerous location. We must not forget that, and is in close connection with the tissues involved. The roof of the attic is the floor of the middle cerebral fossæ, and if the pus burrows straight backwards it only has a short distance to go before it comes in contact with the lateral sinus.

The doctor spoke of blood examinations. If you have general infection it will reveal it. In ordinary pus cases the blood gives you little idea what is going on. But the moment the lateral sinus is involved the blood examination is important. It will not give you very much light unless you are commencing to get a general infection. Rest in bed in all these cases is the most important thing in connection with the treatment. The patient should go to bed and stay to bed. One of those cases I put to bed almost immediately and yet I had to operate just the same. We

hear a great deal said about conservative treatment and radical treatment. I have thought a great deal about the conservative and the radical in connection with these mastoid cases, and I am coming to the belief that the man who operates early and thoroughly is the conservative and the man who delays too long becomes a radical. I may be conservative in my radicalism, but the other man is radical in his conservatism. (Applause).

Dr. KIRKENDALL: Mr. Chairman, may I rise for the purpose of making a correction. I did not wish to be understood by those present as saying that I did not believe in extreme heat. I understood the doctor as referring to poultices and hot water pack. I use extreme heat 135 degrees of temperature, with a great many pleasant results in acute otitis media. I wish that to be understood.

Dr. SEILER: Mr. Chairman, may I rise to make a statement, or rather answer an accusation. I have treated not only Dr. Seiler's case but thousands of others, and I have examined, myself, or had the exudation examined by a so-called pathologist who is nothing more or less than a bacteriologist, and not a pathologist, and by myself. I have a microscope which is a microscope and not one of those things which they crane over, and can not see because the pressure on the neck produces congestion of the retina. Of course people can see all sorts of things in a microscope, but I speak of what I know. Before we knew anything of bacteria we examined pus and knew the difference under the microscope between pus and mucus. We did not have to be told it was pus and we did not look simply for bacteria or micrococci. That is what I wish to say in reply, but there is one point I will touch upon and that is I think, where theory and practise and pathology are somewhat at variance. That the presence of pus in the ear and the mastoid is much more dangerous than its presence in the abdominal cavity because it is in such close proximity to the brain and the meninges is anatomically correct, but pathologically or histologically not, for the reason that in the first case there is a far superior barrier to the force of the pus to bore through than are the several tissues of the abdominal cavity. You can find that a thin steel plate is a much better armor than a thick iron one. I full agree with the doctor that it is a wise provision of nature or providence that the little thin plate bone exists between the roof of the attic and the floor of the middle cerebral fossæ, but as a matter of fact in brain complications where we get pus in the middle cerebral fossæ, it must always go through there. I have examined a great many cases and in all the cases when the pus gets into the middle cerebral fossæ it goes through that very point.

Dr. MCCAW: Mr. Chairman, Dr. Phillips has covered the ground and answered the questions very thoroughly and I can only coincide with what he has said. I would like, however, to express an opinion, or rather to ask a question of Dr. Seiler, as to how he accounts for the purulent cases that we do get? We do,

absolutely get purulent cases in the middle ear following grip infection. There is absolutely no question about that. He makes a very positive statement and says that it is not pus. I would like to know what it is?

Dr. SEILER: Mucus, I told you.

Dr. MCCAW: It is streptococcus infection and if streptococcus is a biogenic organism, and is a pus producing organism, why is it that it is not pus? All pathologists agree, as far as I am aware, or a large majority of them. Dr. Ward, in his discussion, has called attention to the fact that he would extend the time limit for conservative treatment of these cases. I fully agree with Dr. Phillips that Dr. Ward is dealing with an entirely different variety of cases, namely purulent cases following typhoid fever which are not as virulent as these cases we are discussing.

Dr. WARD: Mr. Chairman, allow me to make myself clear. Cases not due to either streptococci or grip are cases where I would use the palliative measures. Never use it in the others, and not beyond twenty-four hours.

Dr. MCCAW: Mr. Chairman, I know in acute infections, and as I tried to draw out in the paper that there are two varieties of infection in these cases we meet with; one seems to be a pure infection as it were, which I tried to account for by the experiments which I called attention to of inoculations into the differcavities of the body, and in some the experimenter did not get any, in a majority he did not get purulent infection. In only about five cases out of twenty injections into the middle ear did he get purulent infection.

In regard to the hearing in these cases my experience has been practically the same as Dr. Phillips. He has expressed that very fully, and I believe the earlier we operate on these cases the better will be the result as regards hearing. I believe where we allow the cases to go on and the destructive process has involved the bony structure of the middle ear, the osseous chain, I think we get a very much more impaired condition of the hearing after these operations.

The tip infection. It has been my experience in these cases that we almost invariably find pus extending down to the tip. I have in most of my cases found that condition to be present and I have done a very radical operation and cleaned out all the tissue I possibly could.

As I say, as Dr. Phillips has answered most of these questions, I will not dwell upon them longer.

PAPER:

THE REDUCTION OF TURBINAL HYPERTROPHIES.

D. J. GIBB WISHART, B.A., M.D.

This subject is perhaps worn threadbare—or it is too trivial a one with which to detain the members of a learned society—and yet I believe that you will all agree that on the question of the reduction of a turbinal hypertrophy something still remains to be said, and, further, that a great deal of what has already been said has led to abuses in the way of treatment.

It is true, and probably will always remain so, that a "stuffy nose" is the most common of the complaints of those of our patients who have become conscious that they own a nose, a condition that we describe under the title of "Chronic Hypertrophic Rhinitis," although there is frequently little true hypertrophy to be found present. The tissues that are the offenders in this instance are the inferior turbinal bodies, with the mucous membrane covering them, and the sub-mucous erectile, or vascular tissue, that lies between this membrane and the bone.

Either through an increase in the connective tissue elements themselves, or through a multiplication and distension of the blood interspaces or sinuses, these tissues occupy a relatively greater space than they should, and cause a narrowing of the respiratory area of the nose.

The process need not be confined to the inferior turbinal body, but is to a lesser extent often found in the middle turbinal, chiefly at its anterior extremity and lower border, and in a still lesser degree in the coverings of the septum, anteriorly over the cartilage, and posteriorly just at the edge of the posterior nares, or over and around the apex, or sharpened edge of a septal deflection, which is chronically in contact with the outer wall.

Again, as we well know, while the process may be co-extensive with the inner or free surface, and the lower or free border of the turbinal body, it is apt to be exaggerated at one or more points, the favorite being the anterior and posterior extremities, the former interfering with free inspiration, and the latter with free expiration.

There are other elements which assist in producing the nasal

stenosis, if not by direct influence upon the turbinal bodies, at least by so narrowing the passage that a lesser hypertrophy of the turbinal bodies suffices to produce obstruction; the commonest of these are deflections and irregularities in the surface or in the position of the septum, but we also find variations in shape, projection, and position of the turbinals themselves, and at times the whole nasal cavity is contracted congenitally without any of the component parts being chiefly to blame.

The above description has been necessary, because I have desider to show that respiratory insufficiency is not a simple, but a complex problem, requiring the most careful exploration by the eye and probe, and always with the assistance of cocaine and suprarenal extract. This exploration must be done deliberately, after obtaining the patient's own account of the difficulty experienced, and with the elucidation provided by further questioning as we proceed with the examination.

More remote, but still most important, considerations in a proper estimation of these cases are the occupation, the environment, the climatic conditions which obtain, the nervous mechanism of the patient, the habits of life, the use of alcohol, tobacco, etc.

In no case can the surgeon rightly hope to arive at a just conclusion of the precise measure to be adopted to relieve the nasal respiratory insufficiency until he has canvassed each and all of the above elements in its production and maintenance, and has applied his matured experience to the solution of the problem.

In defiance of the considerations involved, and of the frequency with which the surgeon is called upon to deal with these cases, there is only too great reason to believe that they do not receive either proper diagnosis or treatment at the hands of the general practitioner, or, let us but whisper it, at the hands of the specialist.

If this be so—and every year of experience convinces me that a nasal insufficiency is always a difficult problem, and that failure to relieve is generally due to a failure to obtain a grasp of the elements of the problem—is it not the case that we are ourslves to blame?

How often do we read articles in which some "blanket" form of treatment is set forth in the well-known terms of the patent medicine, as curing insufficiency and all allied near and remote conditions; and the general practitioner, for whose benefit these particular articles are always copied whole and scattered widely

by means of the $1 a year medical journal, furnished to all the profession, thinks that he has found a sovereign specific and hastens to the assistance of his victim, confident in the fact that Dr. Blank, the eminent specialist, has "abandoned all other forms of treatment" in favor of this new method.

I desire to dissent most vigorously from such careless bargain day method of treating any form of nasal complaint, and especially turbinal hypertrophy, because it is so common, and because it is the one form of nasal trouble which the general practitioner is most likely to consider himself able to deal with. No, every case of nasal insufficiency requires careful diagnosis, and as careful treatment, each case strictly upon its own merit, and from this it will follow certainly that every case may have a treatment differing in some detail from any other of its class, just to the extent that the shape of the turbinal bone, the position of the septum, the degre of the hypertrophy, the occupation of the patient, etc., may determine.

Tubinotomy, partial or complete, supra or a sub-mucous, cauterization, swabbing, spraying, linear incision, the cold or hot snare, all have their uses, but must not be abused, nor can the surgeon limit his treatment to any one of these. The utmost judgment is required in their use, and none of them are to be trifled with.

It is to be noted again that it is frequently urged by the advocates of some particular method of treatment that the others have been abandoned because the results were not permanent. Their result of treatment—permanency—is surely not one that can legitimately be expected in the treatment of the great majority of cases of turbinal hypertrophy, namely those where a reduction of the soft tissues will relieve the stenosis; in other words, it can only legitimately be expected where there is removal of bone or cartilage. This fact, however, is one that seems to be forgotten, or perhaps the surgeons believe permanency can be attained, and they endeavor to give effect to their beliefs.

How is it possible to so alter the turbinal tissues, that a patient may live on in the old surroundings, at the old trade, with the same nervous system and exposed to the same climatic conditions, and yet expect that these will not reproduce the nasal stenosis which they had so large a share in producing before.

It is certainly true that nasal insufficiency is a very common disorder in the cities which border our large lakes, whose inhabitants are exposed to such varying conditions in the temperature

and moisture of the air they breathe; with the thermometer ranging from fifty degrees above to ten degrees below zero, in the twenty-four hours or less; with the wind that brought us snow from the northwest veering round to the southeast, from whence it brings us rain next day—conditions which prevail on our great lake shores for at least four months of every year. It is nonsense to expect that the application of any drug or instrument to a turbinal hypertrophy can forever free the nasal passages of these citizens from the necessary effects of this climatic strain.

Then tendency of turbinal hypertrophy is always toward a return, and the manner in which this should be met is not by wholesale destruction of the turbinal tissue, or by the securing of a patency of the respiratory area by an extensive removal of bone. We should advise our patients that they must submit themselves for regular examination and regular treatment every six months, or at the utmost every year, and that if they but comply with this simple request they will continue to enjoy, at slight expense and with moderate treatment, comparative immunity from the nasal insufficiency.

This is but urging the same line of action as we adopt with regard to the care of the teeth, and as we would probably adopt with regard to any other part of the body which was liable to break down.

In the December, 1900, issue of the *Laryngoscope*, Jackson, mentioned a surgeon who for years had been cutting out both middle and inferior turbinals on both sides for the cure of every human ache and ailment wherever located. He should go further and substitute for the nasal mucous membrane and the structures upon which it is super-imposed, some device of equal usefulness with a complete set of artificial teeth, or the artificial larynx, and I ask their pardon for introducing them to such a companion, although the patient would be rendered immune to the effect of climate and entourage, and the surgeon's name would become immortal in Hades.

I am thankful to say that I have but once done a complete turbinotomy, and that was an accidnet. Total removal of a turbinal for nasal insufficiency I can hardly conceive of as possible, and it must be very clearly indicated indeed if even partial removal is thought of. The aim must always be to save every line of nasal mucous membrane that is possible, and therefore I would prefer to adopt the sub-mucous galvano-puncture, or the turbinal trocar, or the anglar handled Graefe knife, introduced

through a linear puncture, in every instance that will admit. The spokeshave is inadmissible in the nose except for uses which I have indicated elsewhere. (See *Laryngoscope*, July, 1900), and the scissors or snare can accomplish all the clipping of the turbinal that is required.

Let us unite in advocating a conservatism in our methods of treating nasal insufficiency, and our patients will thank us, and our influence upon our fellow-practitioner will be for good and not harm.

DISCUSSION.

D. Lincoln: Mr. Chairman, I have listened to this paper with great interest, following out the the lines of thought. Living in a community which I judge is somewhat similar to his own locality I fully agree with what he says in reference to the destruction of mucous membrane, particularly that which covers the inferior turbinate. As to his method in the particular treatment of the turbinate he speaks of I never saw a case where I thought it was advisable or justifiable. I have seen the operation done, I am glad to say not in this country. As to the puncture of the membrane by the methods the doctor advises, in my own hands the slight cauterization in a minor fashion of the turbinate has answered every purpose. I may say, however, I do not find it necessary to repeat it in many cases, but I always explained to the patient that my experience has been the condition may relapse, and that the identical operation may have to be repeated probably more than once. It seems to me this simple method of operating and relieving your patient from time to time is much more advisable, much more sensible and more justifiable.

Dr. Phillips: Mr. Chairman, in connection with the use of the galvano-cautery in the inferior turbinated bone, I would like to say that I do not use it in the ordinary way as much as I did, but of late I have been using the sub-mucous application of the galvano-cautery, using very, very fine electrodes long enough to go through to the bone and making the cauterization near the bone and burning the tissue, cauterizing the tissue beneath the mucous membrane. I have been surprised to see the results which I get. It is far better than the external application of the galvano-cautery, because you get more contraction in the tissues underneath the membrane and it is very satisfactory. As to the destruction of turbinated tissue, I suppose he referred to the inferior turbinated bone, because any one who is doing much work in the diseases of the accessory sinuses must be sure to find a great many cases where the middle turbinate has undergone such a degeneration, and where the degenerative process has gone to such an extent that we have a system, the middle turbinated bone, the cavity of which directly communicates with the inferior ethmoidal cells, so that we are glad to destroy all that we can

get hold of with that snare. It is impossible to remove it all, but we remove all we can. As to the complete removal of the inferior turbinated bone, I think it is bad surgery and should be condemned every time. I think it is important at times to remove some portions of it in order to establish drainage and enable patients to breathe properly.

Dr. Theisen: Mr. Chairman, I enjoyed Dr. Wishart's paper very much and I think he is to be congratulated. A few years ago Dr. Jones published a paper recommending an instrument which he called a spoke-shave, and published some seventeen cases of the complete removal. I never performed it and I would not if I lived to be a hundred. I do not believe the operation ought to be done by any specialist. Dr. Jones claims in that paper that the mucous membrane re-forms. I do not believe anything of the sort. I do not believe where you take away so much of the mucous membrane it ever re-forms. I believe if these cases were followed up and seen a certain number of years after the operation that you would find an atrophic condition. I do not want to say that you would have a true atrophic rhinitis, but you would find an atrophy of the turbinated bodies. I think the old experiment Kampler has used is a good one, that is the use of the cautery. I do not believe the cautery ought ever to be employed in cases of chronic hypertrophic rhinitis. It ought never to be applied to a turbinal swelling which the early touch of a probe does not contract, that is, on which the probe does not make any impression. If the probe does not sink in I do not think the cautery should be applied. I believe in very many cases, especially in chronic hypertrophic and atrophic rhinitis the cautery is abused. I believe a very thin electrode, as Dr. Phillips advised, as thin as you can get, simply puncturing the inferior or middle turbinate in two or three places is quite sufficient in those cases. Dr. Kampler's test, which I believe is an excellent one, was to touch the turbinated mucous membrane with a probe. He found that in nearly every one of the cases the swelling collapsed, disappeared almost entirely, and in those cases the cautery is of no use. I do not believe it is of any use in a case of chronic hypertrophic rhinitis. In those cases I think the only thing to do is to remove a very small portion. I believe in the large majority of cases no operative measure at all is necessary, that is, provided you have no deviation of the septum. I believe simple measures of cleansing is all that is necessary.

Dr. Wishart: Mr. Chairman and Gentlemen:—Nobody could help feeling gratified at the way the paper has been received. I have only to say that it was caused by a sort of feeling of indignant exasperation one occasionally experiences when he reads articles that appear in some of our special journals where we see some particular form of treatment advocated as the cure-all in these cases on chronic atrophic rhinitis. I had no intention of saying that the removal of turbinated bone, pieces or the whole of it, might not be necessary. The last speaker referred to the

spoke-shave and a number of cases described, as he said, where the whole or the larger portion of the turbinated bone was removed in order to relieve cases of chronic hypertrophic rhinitis. As I said before, I hope never to remove a turbinal bone for that purpose alone by the use of a spoke-shave. I do use that spoke-shave, very frequently, however, I use it for certain form of sput upon the septum, which I find can be very easily removed by it, but that I will not go into now. I have described it elsewhere; but that is the only way in which I would use it.

BUSINESS MEETING.

The seventh annual meeting of the American Laryngological, Rhinological and Otological Society convened at the Academy of Medicine, New York City, N. Y., May 23, 24 and 25, 1901.

The Society was called to order at 10.25 A. M., by the President, Dr. Robert C. Myles. During the sessions of the Society the following Fellows registered:

Myles, Robert C., New York City.
Phillips, Wendell C., New York City.
Stein, Otto J., Chicago, Ill.
McCaw, James F., Watertown, N. Y.
Lincoln, Wm., Cleveland, Ohio.
McKernon, James F., New York City.
Abrams, A. E., Hartford, Conn.
Vansant, E. L., Philadelphia, Pa.
Kimball, I. E., Portland, Maine.
Gibb, Joseph S., Philadelphia, Pa.
Curtis, H. Holbrook, New York City.
Tyson, H. H., New York City.
Berens, T. Bassmore, New York City.
Munger, Carl E., New York City.
Wagner, Henry L., San Francisco, Cal.
Fleming, E. W., Los Angeles, Cal.
Lederman, M. D., New York City.
Brown, Price, Toronto, Canada.
Chenery, Wm. E., Boston, Mass.
Page, L. F., Indianapolis, Ind.
Lewis, Robert, Jr., New York City.
McAuliffe, George B., New York City.
Grayson, Chas. P., Philadelphia, Pa.
Roy, Dunbar, Atlanta, Ga.
Murray, G. D., Scranton, Pa.
Dudley, W. H., Easton, Pa.
Johnson, Walter B., Paterson, N. J.
Ward, M. R., Pittsburg, Pa.
Wilson, Norton L., Elizabeth, N. J.

Solly, S. E., Colorado Springs, Colo.
White, J. A., Richmond, Va.
Payne, Redmond, San Francisco, Cal.
Hill, J. F., Waterville, Me.
Chambers, J. R., Jersey City.
Brandegee, W. P., New York City.
Goldstein, M. A., St. Louis, Mo.
Day, Dr. Ewing W., Pittsburg, Pa.
Kenefic, Joseph, New York City.
Pooley, Thomas R., New York City.
Friedenberg, Edward, New York City.
Halstead, Thomas H., Syracuse, N. Y.
Corwin, T. W., Newark, N. J.
Mial, L. L., New York City.
Atkinson, J. Wm., Paterson, N. J.
Hepburn, N. J., New York City.
Smith, S. MacCuen, Philadelphia, Pa.
Duel, Arthur B., New York City.
Root, Arthur G., Albany, N. Y.
Oppenheimer, Seymour, New York City.
Wright, Jonathan, Brooklyn, N. Y.
Pierce, Norval H., Chicago, Ill.
Haskin, W. H., New York City.
Manson, C. A., New York City.
Freudenthal, W., New York City.
Jack, Fred L., Boston, Mass.
Knowles, W. F., Boston, Mass.
Hyatt, Frank, Washington, D. C.
Quinlan, Francis J., New York City.
Collins, Burnett C., Brooklyn, N. Y.
Culbert, W. L., New York City.
Dudley, Wm. F., Brooklyn, N. Y.
McGahan, C. F., South Carolina.
Harris, Thomas J., New York City.
Coffin, Lewis A., New York City.
Snow, Sargent F., Syracuse, N. Y.
Hartz, Henry J., Detroit, Mich.
Richardson, Chas. W., Washington, D. C.
Dench, E. B., New York City.
Rogers, F. T., Providence, R. I.
Donnellan, P. S., Philadelphia, Pa.
Stucky, J. A., Lexington, Ky.

Richards, George L., Fall River, Mass.
Cobb, Frederic C., Boston, Mass.
Coakley, C. G., New York City.
Sheppard, J. E., Brooklyn, N. Y.
Lutz, Stephen H., Brooklyn, N. Y.
Farrell, T. H., Utica, N. Y.
MacKuen, G. Hudson, Philadelphia, Pa
Holt, F. E., Portland, Me.
McClelland, Lefferts, Brooklyn, N. Y.

After calling of the roll, an address of welcome was delivered by Dr. D. B. St. John Roosa, of New York City. This was followed by the annual address of the President of the Society.

The exhibition of cases and presentation of instruments then took place, after which followed the reading of the papers assigned for the morning.

At 3 P. M. the society held an executive session, the first order of business being the election of new members. The secretary read the list of candidates approved by the Council. The following were the nominees for resident members:

Joseph H. Abraham, of New York City, proposed by Drs. McKernon and Richardson; Dr. William T. Bolton, Pasadena, Cal., proposed by Drs. Day and Ward; Burton S. Booth, M.D., of Troy, N. Y., proposed by Drs. Renner and Myles; J. Solis Cohen, of Philadelphia, proposed by Drs. Kyle and Pierce; J. G. Connell, M.D., of Kingston, Ontario, proposed by Drs. Farrell and Brown; J. Homer Coulter, M.D., of Chicago Ill., proposed by Drs. Loeb and Goldstein; J. Frank Crouch, M.D., Baltimore, Md., proposed by Drs. McKernon and Phillips; George Fetterolf, M.D., of Philadelphia, proposed by Drs. Kyle and Phillips; Wolff Freudenthal, M.D., of New York City, proposed by Drs. Harris and Phillips; Wm. H. Haskin, M.D., New York City, proposed by Drs. Harris and Clemens; Thomas Hubbard, M.D., Toledo, Ohio, proposed by Drs. Richardson and McKernon; Lee Hurd, New York City, proposed by Drs. Clemens and Phillips; Chevalier Jackson, M.D., Pittsburg, Pa., proposed by Drs. Ward and Daly; James L. Kent, Lynchburg, Va., proposed by Drs. White and Dunn; Z. L. Leonard, M.D., New York, proposed by Drs. McKernon and Berens; Charles A. Manson, M.D., New York, proposed by Drs. Phillips and Harris; Robert Milligan, M.D., Pittsburg, proposed by Drs. Day and Ward; Henry L. Myers, Norfolk, Va., proposed by Drs. Dench and

White: Lefferts A. McClelland, Brooklyn, N. Y., proposed by Drs. Roosa and Hoople; Robert E. Moss, M.D., San Antonio, Texas, proposed by Drs. Reynolds and Myles; William H. Roberts, Pasadena, Cal., proposed by Drs. Fleming and Ward; Wm. Bayard Shields, M.D., St. Louis, Mo., proposed by Drs. Stucky and Myles; Wm. R. Thompson, M.D., Alabama, proposed by Drs. McKernon and Phillips; Dr. Amos R. Solenberger, Colorado Springs, Colo., proposed by Drs. Solly and Gildea; Paul F. Soudern, New York, proposed by Drs. Clemens and Phillips; John K. Sterrett, M.D., Pittsburg, proposed by Drs. Ward and Day; Henry H. Tyson, M.D., New York, proposed by Drs. Dudley and McKernon; Walter A. Wells, Washington, D. C., proposed by Drs. Hyatt and Richards. The Council also recommended Dr. George Poyet, of Paris, France, for non-resident membership.

On motion, the President appointed a committee of five to list of names as read, and they were declared elected to membership.

On motion, the President appointed a committee of five to serve as members of the Nominating Committee. The following were appointed: M. R. Ward, of Pittsburg Pa.; Henry L. Wagner, of San Francisco, Cal.; S. E. Solly, of Denver, Colo.; J. A. Stucky, of Lexington, Ky., and W. C. Phillips, of New York.

The President appointed on the Auditing Committee George L. Richards, of Fall River, Mass., Francis J. Quinlan and T. B. Berens, of New York.

At the business meeting of the second day the minutes covering the proceedings of the sixth annual meeting were read and approved. The reports of the Secretary and Treasurer were then read and approved.

Secretary's Report.

Your Secretary takes pleasure in presenting to the Society a copy of the "Seventh Annual Transactions." Those elected to active membership in the Society at the last annual meeting have duly qualified, with one exception. There has been one resignation, that of Charles W. Kinney, of New York City. Since the last meeting, two active Fellows have died, Dr. Ralph J. Wenner, of Cleveland, Ohio, and Dr. D. Rankin, of Allegheny, Pa. This leaves our total membership 203.

During the year two meetings of the Council have been held,

and the minutes of these will now be read. The Secretary would report that the back volumes of Transactions have been stored and insured.

The Secretary would report that arrangements have been effected with the Bureau of International Exchanges of the Smithsonian Institute, at Washington, whereby the distribution of copies going to foreign countries will be attended without expense to the Society.

Respectfully sumbitted,

WENDELL C. PHILLIPS.

Treasurer's Report, 1900-1901.

RECEIPTS.

Balance from 1900 account	$592.67
Dues for current year	515.00
Back dues	400.00
Initiation fees	225.00
Sale of Transactions	24.50
	$1,757.17

DISBURSEMENTS.

Transactions for 1899, Rooney & Otten	$362.54
Stenographer's fee	90.00
Printing, postage, clerical expenses, and engraving certificates	331.80
	$784.34

Total receipts	$1,757.17	
Total disbursements	784.34	
Leaving balance to new account of		$972.83
Liabilities due the Treasurer		410.00

Audited, and found correct.

GEO. L. RICHARDS,
(Signed) FRANCIS J. QUINLAN,
T. B. BERENS,
Auditing Committee.

New York, May 2, 3, 4, 1901.

On motion, duly seconded and carried, a resolution was passed providing that copies of the Transactions of the Society should be supplied *gratis* to medical libraries asking for them.

The following amendment to the Constitution was unanimously adopted:

"All candidates for admission to the Society shall be required to present a Thesis, when requested by the Council and also, if so desired by the Council, such Thesis shall be read before the Session or before the Section in which the candidate resides."

The Council made the following recommendations:

(1) That in the future candidates for admission into this Society shall show conclusively, and to the satisfaction of the Council, that they have been engaged in the practice of special medicine, that is, diseases of the nose, throat and ear, for a period not less than five years. (2) That the Secretary of this Society send to each of its members, at least sixty days prior to the annual meeting, the names of all candidates proposed for membership, together with the names of the proprosers and seconders of said candidates. (3) That the applications of all candidates be forwarded to the Secretary of this Society not later than February 15th of each year, prior to the annual meeting.

On motion, the recommendations were carried.

On motion, it was voted that the Transactions of the Sections shall appear in the regular volume of the Transactions of the Society, if received by the Publication Committee in proper form.

Dr. M. R. Ward, chairman of the Nominating Committee, presented the following report of officers for the ensuing year:

President—Dr. Charles W. Richardson, of Washington, D. C.

Vice-Presidents—

Eastern Section—Dr. H. Holbrook Curtis, of New York.

Middle Section—Dr. H. W. Loeb, St. Louis, Mo.

Southern Section—Dr. C. F. McGahan, of Aitken, S. C.

Western Section—Dr. E. W. Fleming, of Los Angeles, Cal.

Secretary—Dr. Wendell C. Phillips, of New York.

Treasurer—Dr. Ewing W. Day, Pittsburg, Pa.

Council—Drs. W. Braden Kyle, S. E. Solly, J. F. McKernon, S. MacCuen Smith, F. C. Cobb, Norval H. Pierce, T. B. Berens and J. A. White.

Library Committee—Drs. H. Holbrook Curtis, G. Hudson Makuen, A. B. Duel, G. L. Richards and T. J. Harris.

Publication Committee—Drs. T. J. Harris, A. B. Duel and G. Hudson Makuen.

On motion, the Secretary was instructed to cast the ballot of the Society for the officers whose names had been duly presented, which he did, and they were declared elected.

The President, after expressing his appreciation of the cordial co-operation of the membership in the administration of the affairs during the year, appointed a committee, Drs. Solly and Curtis, to escort the president-elect to the chair. The retiring President, Dr. R. C. Myles, then presented Dr. Charles W. Richardson as the President for the coming year. On taking the chair, Dr. Richardson thanked the Society for the honor conferred upon him.

The following resolution was adopted: That a vote of thanks be extended to the New York Academy of Medicine, and the members residing in New York and vicinity, for their hospitality.

Voted that the thanks of the Society be extended to the retiring President for the able and impartial manner in which he discharged the duties of the office.

There being no further business, on motion the Society was adjourned.

FELLOWS.

Abraham, Jos. H., New York City.
Abrams, Alva E., Hartford, Conn.
Adams, John L., New York City.
Alderton, Henry A., Brooklyn, N. Y.
Arnold, J. Dennis, San Francisco, Cal
Atkinson, Wm. J., Paterson, N. J.
Ballenger, Wm. Lincoln, Chicago, Ill.
Bartlett, Edwin W., Milwaukee, Wis.
Battle, S. Westray, Asheville, N. C.
Berens, Bernard, Philadelphia, Pa.
Berens, Conrad, Philadelphia, Pa.
Berens, T. Passmore, New York City
Black, James A., San Francisco, Cal.
Bolton, Wm. J., Pasadena, Cal.
Booth, Burton S., Troy, N. Y.
Braislin, W. C., Brooklyn, N. Y.
Brandegee, Wm. P., New York City.
Brown, Lennox, London, England.
Brown, Price, Toronto, Ontario, Can.
Bulette, Wilbur W., Pueblo, Colo.
Burnett, Peter Valentine, Brooklyn, N. Y.
Calhoun, A. W., Atlanta, Georgia.

Chambers, Talbot R., Jersey City, N. J.
Chapman, S. Hartwell, New Haven, Conn.
Cheatham, Wm., Louisville, Ky.
Chenery, Wm. E., Boston, Mass.
Christy, T. Chalmers, Pittsburg, Pa.
Clemens, James B., New York City.
Cline, Lewis C., Indianapolis, Ind.
Clough, Herbert L., Bangor, Me.
Coakley, Cornelius G., New York City.
Cobb, Frederick C., Boston, Mass.
Coffin, Lewis A., New York City.
Coggeshall, Henry, New York City.
Cohen, J. Solis, Philadelphia, Pa.
Collins, Burnett C., Brooklyn, N. Y.
Connell, J. C., Kingston, Ontario, Can.
Corwin, Theodore, Newark, N. J.
Cox, Charles N., Brooklyn, N. Y.
Crockett, Eugene A., Boston, Mass.
Crouch, J. Frank, Baltimore, Md.
Culbert, Wm. Leddie, New York City.
Curtis, H. Holbrook, New York City.
Dabney, Samuel G., Louisville, Ky.
*Daly, Wm. H., Pittsburg, Pa.
Day, Ewing W., Pittsburg, Pa.
Dench, E. B., New York City.
Dessar, L. A., New York City.
Donnellan, Patrick S., Philadelphia, Pa.
Douglas, O. B., Concord, N. H.
Douthett, J. M., Pittsburg, Pa.
Dudley, Wm. Frederick, Brooklyn, N. Y.
Dudley, Wm. Henry, Easton, Pa.
Duel, Arthur B., New York City.
Dunn, John, Richmond, Va.
Eagleton, Wells P., Newark, N. J.
Ellis, H. Bert, Los Angeles, Cal.
Farrell, Thomas Hy., Utica, N. Y.
Fetterolf, George, Philadelphia, Pa.
Fleming, Earnest W., Los Angeles, Cal.
Freudenthal, Wolff, New York City.
Fitzpatrick, T. V., Cincinnati, Ohio.
Freman, Walter J., Philadelphia, Pa.
Friedenberg, Edward, New York City.

Frothingham, R., New York City.
Fryer, Blencove E., Kansas City, Mo.
Gallagher, Thomas J., Denver, Col.
Gibb, Joseph S., Philadelphia, Pa.
Gildea, Patrick F., Colorado Springs, Colo.
Goff, Waldo Percy, Clarksburg, W. Va.
Goldstein, Max A., St. Louis, Mo.
Goughenheim, Achille, Paris.
Grady, L. B., Nashville, Tenn.
Grant, Dundas, London, England.
Grayson, Charles P., Philadelphia, Pa.
Greene, J. Orne, Boston, Mass.
Gruber, Jos., Vienna.
Haddock, Charles W., Beverly, Mass.
Hall, G. P., Galveston, Texas.
Halstead, Thomas H., Syracuse, N. Y.
Harris, Thomas J., New York City.
Hartz, Henry Jasper, Detroit, Mich.
Haskin, Wm. H., New York City.
Heckel, Edward B., Pittsburg, Pa.
*Hengst, D. A., Pittsburg, Pa.
Hepburn, Neil J., New York City.
Heryng, T., Warsaw, Russia.
Hill, J. F., Waterville, Me.
Hinkel, F. W., Buffalo, N. Y.
Hoch, Wm. R., Pueblo, Colo.
Holmes, Christian R., Cincinnati, Ohio.
Holt, Edward E., Portland, Me.
Hoople, H. Nelson, Brooklyn, N. Y.
Hopkins, F. E., Springfield, Mass.
Hopkins, Wm. E., San Francisco, Cal.
*Hopkins, Woolsey, New York City.
Hubbard, Dwight L., New York City.
Hubbard, Thomas, Toledo, Ontario.
Hurd, Lee, New York City.
Hyatt, Frank, Washington, D. C.
Ingersoll, John M., Cleveland, Ohio.
Jack, F. L., Boston, Mass.
Jackson, Oliver H., Fall River, Mass.
Jackson, Chevalier, Pittsburg, Pa.
Joal, Joseph, Paris.
Johnson, Walter B., Paterson, N. J.

Karwowski, Constantine, Warsaw, Russia.
Keiper, George Frederick, Lafayette, Ind.
Keller, Thomas F., Toledo, Ohio.
Kenefick, Joseph A., New York City.
Kent, James Ligon, Lynchburg, Va.
Kibbe, A. B., Seattle, Wash.
Kimball, Irving E., Portland, Me.
King, Wm. Howard, Philadelphia, Pa.
Kirkpatrick, E. A., Halifax, N. S.
Knowles, W. F., Boston, Mass.
Koyle, F. H., Hornellsville, N. Y.
Kyle, D. Braden, Philadelphia, Pa.
Lanfried, C. J., New Orleans, La.
Lederman, M. D., New York City.
Leonard, Zenos, L., New York City.
Lester, John C., Brooklyn, N. Y.
Levy, Robert, Denver, Colo.
Lewis, Robert, Jr., New York City.
Libby, George F., Colorado Springs, Colo.
Lincoln, Wm. R., Cleveland, Ohio.
Linhart, C. P., Columbus, Ohio.
Loeb, H. W., St. Louis, Mo.
Logan, James E., Kansas City, Mo.
Lowman, John B., Johnstown, Pa.
Luc, H., Paris.
Lutz, Stephen Henry, Brooklyn, N. Y.
Mabon, John S., Allegheny Pitts, Pa.
MacCoy, Alexander, Philadelphia, Pa.
MacIntyre, John, Glasgow, Scotland.
McKuen, G. Hudson, Philadelphia, Pa.
Malcolm, Percy E. D., New York City.
Manson, Charles A., New York City.
Martin, A., Paris.
Martin, W. A., San Francisco, Cal.
Mial, Leonidas, L., New York City.
Miller, Frank E., New York City.
Miller, Lewis H., Brooklyn, N. Y.
Milligan, Robert, Pittsburg, Pa.
Morgenthau, George, Chicago, Ill.
Moss, Robert E., San Antonio, Texas.
Moure, E. J., Bordeaux, France.
Munger, Carl E., Waterbury, Conn.

Murray, Gilbert D., Scranton, Pa.
Myers, Henry L., Norfolk, Va.
Myles, Robert C., New York City
McAuliffe, G. B., New York City
McCaw, James F., Watertown, N. Y.
McClelland, Lefferts A., Brooklyn, N. Y.
McGahan, Charles F., Aiken, S. C.
McKernon, James F., New York City.
McReynolds, John O., Dallas, Texas.
*Nicholas, J. E., New York.
Norton, Charles E., Lewiston, Me.
*Noyes, J. L., Providence, R. I.
*O'Dwyer, Joseph, New York.
O'Kelley, James P., New Orleans, La.
Onodi, Adolph, Budapest, Hungary.
Oppenheimer, Seymour, New York City.
Packard, Francis R., Philadelphia, Pa.
Page, Lafayette, Indianapolis, Ind.
Parker, Edward F., Charleston, S. C.
Payne, Redmond W., San Francisco, Cal.
Phillips, Wendell C., New York City.
Pierce, Norval H., Chicago, Ill.
Politzer, A., Vienna, Austria.
Pooley, Thomas R., New York City.
Powell, Stephen C., Newport, R. I.
Poyet, George, Paris, France.
Quinlan, F. J., New York City.
Rae, John B., New York City.
*Rankin, D. N., Allegheny, Pa.
Ray, J. M., Louisville, Ky.
Renner, W. Scott, Buffalo, N. Y.
Reuling, George, Baltimore, Md.
Richards, George L., Fall River, Mass.
Richardson, Charles W., Washington, D. C.
Roberts, Wm. Humes, Pasadena, Cal.
Roe, John O., N. Rochester, N. Y.
Rogers, Frederick T., Providence, R. I.
Roosa, D. B. St. John, New York City.
Root, Arthur G., Albany, N. Y.
Ross, George T., Montreal, Canada.
Roy, C. Dunbar, Atlanta, Ga.
Sajous, Charles E., Philadelphia, Pa.

Schadle, J. E., St. Paul, Minn.
Scheppegrell, Wm., New Orleans, La.
Schimeglow, E., Copenhagen, Denmark.
Seiss, Ralph W., Philadelphia, Pa.
Sendziack, Dr., Poland, Russia.
Shattuck, Warren S., Jr., Brooklyn, N. Y.
Sheppard, J. E., Brooklyn, N. Y.
Shields, Wm. Bayard, St. Louis, Mo.
Smith, S. MacCuen, Philadelphia, Pa.
Smith, Harvey W., Winnipeg, Canada.
Smyly, Sir Phillip, Dublin, Ireland.
Snow, Sargent F., Syracuse, N. Y.
Solenberger, Amos R., Colorado Springs, Colo.
Solly, S. E., Colorado Springs, Colo.
Soudern, Paul F., New York City.
Sprague, Frank B., Providence, R. I.
Stein, Otto Jacob, Chicago, Ill.
Sterrett, John K., Pittsburg, Pa.
Stone, J. B., New York City.
Stout, George C., Philadelphia, Pa.
Straight, Howard S., Cleveland, Ohio.
Stucky, J. A., Lexington, Ky.
Taylor, George A., New York City.
Theisen, Clement F., Albany, N. Y.
Thigpen, F. M., Pensacola, Fla.
Thigpen, C. A., Montgomery, Ala.
Thompson, Jno. A., Cincinnati, Ohio.
Thompson, J. C., Pittsburg, Pa.
Thompson, Wm. R., Fort Worth, Texas.
Thorburn, James D., Toronto, Canada.
*Thorner, Max, Cincinnati, Ohio.
Thrasher, A. B., Cincinnati, Ohio.
Tiffany, Flavel B., Kansas City, Mo.
Trask, Sampson, San Francisco, Cal.
Turnbull, Thomas, Allegheny, Pa.
Tyson, Henry H., New York City.
Vansant, Eugene L., Philadelphia, Pa.
Wagner, Henry L., San Francisco, Cal.
Ward, M. R., Pittsburg, Pa.
Waterman, James Sears, Brooklyn, N. Y.
Wells, Walter A., Washington, D. C.
*Wenner, Ralph J., Cleveland, Ohio.

*Whistler, W. McNeill, London, England.
White, Jos. A., Richmond, Va.
Willetts, Joseph E., Pittsburg, Pa.
Wilson, Norton L., Elizabeth, N. J.
Winslow, John R., Baltimore, Md.
Wishart, D. J. Gibb, Toronto, Canada.
Woakes, Edward, London, England.
Wolfenden, R. Norris, London, England.
Woodward, John T., Norfolk, Va.
Wright, Jonathan, Brooklyn, N. Y.

LIST OF OFFICERS.

Presidents:

1896. Edward Bradford Dench.
1897. Frank Hyatt.
1898. William H. Daly.
1899. S. E. Solly.
1900. D. Braden Kyle.
1901. Robert Cunningham Myles.

Vice-Presidents:

1896. Joseph A. Dwyer.
1897. Frederick L. Jack.
1897. John S. Mabon.
1897. James E. Logan.
1897. William Scheppegrell.
1898. A. W. Calhoun.
1898. J. F. Schadle.
1898. J. A. Thompson.
1898. A. G. Root.
1899. Charles W. Richardson.
1899. Max Thorner.
1899. Henry L. Wagner.
1899. Chas. A. Thigpen.
1900. Robert Levy.
1900. J. A. Stucky.
1900. G. Hudson Makuen.

*Deceased.

1900. Howard S. Straight.
1901. W. Scott Renner.
1901. Norval H. Pierce.
1901. Joseph A. White.
1901. John O. McReynolds.

Secretaries:

1895. Robert Cunningham Myles.
1900. Wendell C. Phillips.

Treasurer:

1900. Dr. Ewing W. Day.

Librarian:

1897. H. Holbrook Curtis.

Past Members:

1895. *Hengst, D. A., Pittsburg.
1895. *Nichols, J. E., New York.
1895. *O'Dwyer, Joseph, New York.
1895. *Noyes, J. I., Providence.
1895. *Thorner, Max, Cincinnati.
1895. Brown, Dillon, New York.
1895. Hobbs, A. G., Atlanta, Ga.
1895. Hodges, R. C., Houston, Texas.
1895. McShane, N., New Orleans.
1895. Seiler, Carl, Philadelphia.
1896. Evans, T. C., Louisville.
1896. Fulton, J. F., St. Paul, Minn.
1896. Joachim, O., New Orleans.
1896. Owsley, F. D., Chicago.
1896. Kinney, C. W., New York.
1896. MacDonagh, ———, Toronto.
1896. *Whistler, W. McNeill, London.
1897. Grove, G. W., Kansas City.
1897. Mullen, J. A., Houston, Texas.
1897. *Rankin, D. N., Allegheny, Pa.
1898. *Hopkins, Woolsey, New York.
1898. *Wenner, Ralph J., Cleveland, Ohio.

*Deceased.

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